CORRECTIVE ACTION STABILIZATION QUESTIONNAIRE

Completed by: Mary Wojciechowski
Date: March 2, 1994

Background Facility Information

Facility Name: Ford Motor Company
EPA Identification No.: MID 044 255 420
Location (City, State): Sterling Heights, Michigan
Facility Priority Rank: Low

1. Is this checklist being completed for one solid waste management unit (SWMU), several SWMUs, or the entire facility? Explain.

Entire facility which includes 10 SWMUs and two AOCs

Status of Corrective Action Activities at the Facility

2. What is the current status of HSWA corrective action activities at the facility?

( ) No corrective action activities initiated (Go to 5)
(X) RCRA Facility Assessment (RFA) or equivalent completed
( ) RCRA Facility Investigation (RFI) underway
( ) RFI completed
( ) Corrective Measures Study (CMS) completed
( ) Corrective Measures Implementation (CMI) begun or completed
( ) Interim Measures begun or completed

3. If corrective action activities have been initiated, are they being carried out under a permit or an enforcement order?

( ) Operating permit
( ) Post-closure permit
( ) Enforcement order
(X) Other (Explain)

Past corrective actions appear to have been voluntary.

4. Have interim measures, if required or completed [see Question 2], been successful in preventing the further spread of contamination at the facility?

( ) Yes
( ) No
( ) Uncertain; still underway
(X) Not required

Additional explanatory notes:

Interim measures have not been officially required.

Facility Releases and Exposure Concerns

5. To what media have contaminant releases from the facility occurred or been suspected of occurring?

(X) Groundwater
(X) Surface water
( ) Air
(X) Soils

6. Are contaminant releases migrating off-site?

( ) Yes; Indicate media, contaminant concentrations, and level of certainty.

Groundwater:
Surface water:
Air:
Soils:

( ) No
(X) Uncertain

7a. Are humans currently being exposed to contaminants released from the facility?

( ) Yes (Go to 8a)
( ) No
(X) Uncertain

Additional explanatory notes:

It is not known if contamination has migrated off site.

7b. Is there a potential for human exposure to the contaminants released from the facility over the next 5 to 10 years?

(X) Yes
( ) No
( ) Uncertain

Additional explanatory notes:

Surface water within 1/2 mile is used for recreation.

8a. Are environmental receptors currently being exposed to contaminants released from the facility?

( ) Yes (Go to 9)
( ) No
(X) Uncertain

Additional explanatory notes:

It is not known if contamination has migrated off site.

8b. Is there a potential that environmental receptors could be exposed to the contaminants released from the facility over the next 5 to 10 years?

(X) Yes
( ) No
( ) Uncertain

Additional explanatory notes:

Wetlands are located on site.

Anticipated Final Corrective Measures

9. If already identified or planned, would final corrective measures be able to be implemented in time to adequately address any existing or short-term threat to human health and the environment?

( ) Yes
(X) No
( ) Uncertain

Additional explanatory notes:

Final corrective measures have not been identified or planned.

10. Could a stabilization initiative at this facility reduce the present or near-term (e.g., less than two years) risks to human health and the environment?

( ) Yes
( ) No
(X) Uncertain

Additional explanatory notes:

Further information on the nature and extent of contamination is needed.

11. If a stabilization activity were not begun, would the threat to human health and the environment significantly increase before final corrective measures could be implemented?

( ) Yes
( ) No
(X) Uncertain

Additional explanatory notes:

Further information on the nature and extent of contamination is needed.

Technical Ability to Implement Stabilization Activities

12. In what phase does the contaminant exist under ambient site conditions? Check all that apply.

( ) Solid
( ) Light non-aqueous phase liquids (LNAPLs)
( ) Dense non-aqueous phase liquids (DNAPLs)
(X) Dissolved in groundwater or surface water
( ) Gaseous
( ) Other _____

13. Which of the following major chemical groupings are of concern at the facility?

(X) Volatile organic compounds (VOCs) and/or semi-volatiles
( ) Polynuclear aromatics (PAHs)
( ) Pesticides
( ) Polychlorinated biphenyls (PCBs) and/or dioxins
( ) Other organics
(X) Inorganics and metals
( ) Explosives
( ) Other _____

14. Are appropriate stabilization technologies available to prevent the further spread of contamination, based on contaminant characteristics and the facility's environmental setting? [See Attachment A for a listing of potential stabilization technologies.]

( ) Yes; Indicate possible course of action.

(X) No; Indicate why stabilization technologies are not appropriate; then go to Question 18.

Further information on the nature and extent of contamination is needed.

15. Has the RFI, or another environmental investigation, provided the site characterization and waste release data needed to design and implement a stabilization activity?

( ) Yes
( ) No

If No, can these data be obtained faster than the data needed to implement the final corrective measures?

( ) Yes
( ) No

Timing and Other Procedural Issues Associated with Stabilization

16. Can stabilization activities be implemented more quickly than the final corrective measures?

( ) Yes
( ) No
( ) Uncertain

Additional explanatory notes:

17. Can stabilization activities be incorporated into the final corrective measures at some point in the future?

( ) Yes
( ) No
( ) Uncertain

Additional explanatory notes:

Conclusion

18. Is this facility an appropriate candidate for stabilization activities?

( ) Yes
( ) No, not feasible
( ) No, not required
(X) Further investigation necessary

Explain final decision, using additional sheets if necessary.

The following information was obtained from a 1993 PA/VSI prepared by PRC.

There have been documented releases of hazardous constituents to soil and groundwater at this facility. Contaminants of concern include VOCs and lead. Suspected sources include former gasoline and oil USTs and a former waste oil lagoon.

Some contaminated soil has been removed but contamination still remains on site. Further investigation on the nature and extent of contamination is necessary before the need for stabilization can be evaluated.

PRC Environmental Management, Inc.
233 North Michigan Avenue
Suite 1621
Chicago, IL 60601
312-856-8700
Fax 312-938-0118

PRELIMINARY ASSESSMENT/ VISUAL SITE INSPECTION

FORD MOTOR COMPANY
STERLING AXLE PLANT
STERLING HEIGHTS, MICHIGAN
MID 044 255 420

FINAL REPORT

Jonathan Adhyay

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, DC 20460

Work Assignment No.	:	R05032
EPA Region	:	5
Site No.	:	MID 044 255 420
Date Prepared	:	April 8, 1994
Contract No.	:	68-W9-0006
PRC No.	:	309-R05032MI54
Prepared by	:	PRC Environmental Management, Inc. (Hans Upadhyay)
Contractor Project Manager	:	Shin Ahn
Telephone No.	:	(312) 856-8700
EPA Work Assignment Manager	:	Kevin Pierard
Telephone No.	:	(312) 886-4448

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FIGURES

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EXECUTIVE SUMMARY

PRC Environmental Management, Inc. (PRC), performed a preliminary assessment and visual site inspection (PA/VSI) to identify and assess the existence and likelihood of releases from solid waste management units (SWMU) and other areas of concern (AOC) at the Ford Motor Company - Sterling Axle Plant (FMC) facility in Sterling Heights, Macomb County, Michigan. This summary highlights the results of the PA/VSI and the potential for releases of hazardous wastes or hazardous constituents from SWMUs and AOCs identified.

The FMC facility manufactures rear axles and drive shafts for automobiles. The facility occupies 155.5 acres in a light industrial area. The facility has a manufacturing building with a floor area of 2,100,000 square feet. A power house and a salvage building with floor areas of about 20,000 and 8,000 square feet, respectively, are located to the north of the manufacturing building. The facility was built in 1955 by FMC. Prior to 1955, the site was used as farmland. In the manufacturing of rear axles and drive shafts, the facility cuts automobile parts from steel beams and subjects them to machining, heat treating, and lapping with a mixture of mineral oil and silicon carbonate.

The facility operates a Wastewater Treatment System (WWTS) (SWMU 5) on site. The facility ceased operating an Inactive WWTS (SWMU 6) in December 1992. The facility has a Storm Water Retention Pond (SWMU 10) which is located at the southeast corner of the facility. SWMU 10 receives storm water runoff from the entire site and separates floating oils from the storm water. The facility has a new aboveground tank farm, which was to begin storing virgin lubricating oil, hydraulic oil, cutting oil, and soluble oil in July 1993. The facility also has an old tank farm, which stores virgin oils in aboveground tanks. The old tank farm had stored virgin oils in five underground tanks from 1956 to 1990.

The FMC facility generates or manages four hazardous and seven nonhazardous waste streams at this facility. In addition, the facility has generated and managed two hazardous waste streams in the past. Hazardous waste streams currently generated or managed at the facility include the following: waste petroleum naphtha (D001, D018, and D039), spent paint (F005), spent toner (F002), and waste hexane (D001). Hazardous waste streams generated and managed in the past include obsolete laboratory chemicals (D002, D006, U044, U188, and U196) and waste chromium-bearing solution

(D007). Nonhazardous waste streams currently generated or managed at the facility include polychlorinated biphenyl (PCB)-bearing waste transformer oil, waste steel transformer units, wastewater, waste oil, metal chips, waste lapping compound, and fly ash.

The waste oil contains some sludge. The sludge component of the waste oil, which contains manganese phosphate, was initially classified by EPA as hazardous and was assigned F006 RCRA waste code. FMC had stored the sludge-bearing waste oil in two Former Waste Oil Storage Lagoons (SWMU 7) from 1967 to 1986. In 1983, FMC filed a petition with EPA to delist the sludge component by stating that the sludge had no hazardous characteristics and that it did not contain any hazardous constituents. In 1986, EPA delisted the sludge. By the time FMC's petition for delisting the sludge was approved, the facility had removed the sludge-bearing waste oil to an off-site location under an EPA-approved closure plan, and had installed a groundwater monitoring system at the facility.

The facility accumulates hazardous wastes in an Enclosed Container Accumulation Area (CAA) and Container Storage Area (CSA) (SWMU 2) for less than 90 days. However, in 1985, the facility stored hazardous wastes in SWMU 2 for more than 90 days, which made it a RCRA-regulated unit. The facility did not file a Part A permit application for SWMU 2. The Michigan Department of Natural Resources (MDNR) resolved the issue of FMC managing a RCRA-regulated unit without having achieved interim status and did not require FMC to RCRA close the unit. The facility has a National Pollutant Discharge Elimination System (NPDES) permit to discharge noncontact cooling water and storm water to the Moore Drain. The facility is regulated as a large-quantity generator (LQG) of hazardous wastes.

The PA/VSI identified the following 10 SWMUs and 2 AOCs at the facility:

Solid Waste Management Units

1. Enclosed Satellite Accumulation Areas (SAA)
2. Enclosed CAA and CSA
3. Chemical Laboratory
4. Enclosed Waste Polychlorinated Biphenyl (PCB) Storage Area
5. Wastewater Treatment System (WWTS)
6. Inactive WWTS
7. Former Waste Oil Storage Lagoons

8. Metal Chips Storage Area
9. Swarf Mat
10. Storm Water Retention Pond

Areas of Concern

1. Location of 1991 Gasoline Release
2. Location of 1992 Oil Release

SWMU 7 has had a release to on-site soils. SWMU 7 poses a moderate to high potential for future and past release to groundwater because water infiltrating into the ground and passing through the contaminated on-site soils could have impacted the groundwater. SWMU 9 poses a low to moderate potential for future and past release to on-site soils and groundwater because an oil-bearing fluid had spilled over a containment dike onto the surrounding pavement, and the fluid could have migrated into the subsurface soils and groundwater through cracks in the pavement. SWMUs 7 and 9 both pose a low potential for future and past release to surface water because of the absence of a direct migration pathway to the Moore Drain. The ground surface at the facility slopes to the Storm Water Retention Pond (SWMU 10) which collects and treats all facility runoff before discharging to the Moore Drain under an NPDES permit. SWMUs 1, 2, 3, 4, 5, 6, 8, and 10 pose a low potential for future and past releases to groundwater, surface water, and on-site soils. SWMUs 1, 2, 3, and 4 are located inside a building on a concrete floor that does not have any cracks. All containers in SWMUs 1, 2, 3, and 4 appeared to be in good condition, and PRC did not observe any signs of release. PRC did not observe any signs of release from SWMUs 5, 6, and 10. PRC noted metal chips scattered on the pavement outside SWMU 8. However, because of the relatively inert nature of metal chips, it is unlikely that release of any hazardous constituents to any environmental media occurred.

All facility SWMUs pose a low potential for future or past release to air. The containers in SWMUs 1, 2, and 3 are stored indoors and kept closed. The wastes managed in SWMUs 4 through 10 do not contain any known volatile constituents.

At AOC 1, the FMC facility stored leaded and unleaded gasolines in a 15000-gallon steel underground storage tank (UST) during different time periods between 1978 and 1990. The UST was removed to an off-site location in May 1991. During the removal of the UST, releases of gasoline to on-site soils and groundwater were documented. The facility removed the impacted soil to an off-site

facility for landfilling and backfilled the UST cavity with clean soil. The facility collected subsurface soil and groundwater samples during the excavation of the UST and had them analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX), methyl tertiary butyl ether (MTBE), and lead. The soil samples had BTEX, MTBE, and lead contents below the soil cleanup levels defined by the Michigan Environmental Response Act (Michigan Act) 307, but the groundwater sample yielded elevated BTEX levels. The facility installed a monitoring well next to the location of the removed UST, sampled groundwater from the monitoring well, and had it analyzed for BTEX, MTBE, and lead. PRC has identified the Location of 1991 Gasoline Release as an AOC because the contents of the tank were released to the groundwater and the surrounding soils, and the facility did not submit the analytical data on the groundwater sample from the monitoring well to any regulatory agency for review and consideration of the need for further remediation. AOC 1 poses a low potential for release to surface water because any release from the UST would have to migrate upwards and mingle with surface runoff, which appears unlikely. AOC 1 also poses a low potential for release to air because the UST was removed in 1991, and it is unlikely that volatile constituents would still be present in quantities sufficient to impact the air.

At AOC 2, the facility stored virgin hydraulic, cutting, and lubricating oils in five USTs from 1956 to 1990. A release of oil from one or more of these USTs to on-site soils was documented in February 1992. Information on the quantity and the type of oil released is not available. At the time of the VSI, the impacted soil and the empty USTs had not been removed, and the facility was following an MDNR-approved remediation action plan for their removal. PRC identified the Location of 1992 Oil Release as an AOC because soils impacted by the oil release still remain. AOC 2 poses a moderate potential for release to groundwater because the perched groundwater at the FMC facility is within a few feet of the ground surface. AOC 2 poses a low potential for release to surface water because any release from the UST would have to migrate upwards and mingle with surface runoff, which appears unlikely. AOC 2 also poses a low potential for release to air because the released oil did not contain any volatile constituents.

Groundwater is not used as a source of drinking water in the City of Sterling Heights. There are no known groundwater wells in the area. Two wetlands, the Former Waste Oil Storage Lagoons (SWMU 7) and the Storm Water Retention Pond (SWMU 10), are located on site. Moore Drain, the nearest surface water body, is about 300 feet south of the facility and is not used for recreational,

agricultural, industrial, or municipal water supply purposes. The nearest residence is about 500 feet west of the facility. The facility has about 3,000 employees. In 1983, the facility had about 9,000 employees. The facility is encompassed by an 8-foot barbed-wire fence and has 24-hour security guards.

Based on findings during the PA/VSI, PRC recommends the following further actions:

- Analyze subsurface soil from the vicinity of the Former Waste Oil Storage Lagoons (SWMU 7) for total petroleum hydrocarbons (TPH); if subsurface soil contains TPHs, analyze groundwater for TPH contamination.

- Contain the metal chips within the limits of the Metal Chips Storage Area (SWMU 8).

- Drain the pool of oil-bearing fluid from the pavement located outside the containment dike of the Swarf Mat (SWMU 9) and inspect the pavement for cracks; if cracks are found, analyze the subsurface soil for TPHs; if the subsurface soil contains TPHs, analyze the groundwater for TPH contamination; keep the waste from spilling over the containment dikes of the SWMU.

- Submit the analytical data on the groundwater collected from the monitoring well near the Location of 1991 Gasoline Release (AOC 1) to a regulatory agency for review and consideration of the need for further remediation.

- Continue remediation action at the Location of 1992 Oil Release (AOC 2) in accordance with the remediation action plan approved by MDNR.

PRC recommends no further action at this time for SWMUs 1, 2, 3, 4, 5, 6, and 10.

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC), received Work Assignment No. R05032 from the U.S. Environmental Protection Agency (EPA) under Contract No. 68-W9-0006 (TES 9) to conduct preliminary assessments (PA) and visual site inspections (VSI) of hazardous waste treatment and storage facilities in Region 5.

As part of the EPA Region 5 Environmental Priorities Initiative, the RCRA and CERCLA programs are working together to identify and address RCRA facilities that have a high priority for corrective action using applicable RCRA and CERCLA authorities. The PA/VSI is the first step in the process of prioritizing facilities for corrective action. Through the PA/VSI process, enough information is obtained to characterize a facility's actual or potential releases to the environment from solid waste management units (SWMU) and areas of concern (AOC).

A SWMU is defined as any discernible unit at a RCRA facility in which solid wastes have been placed and from which hazardous constituents might migrate, regardless of whether the unit was intended to manage solid or hazardous waste.

The SWMU definition includes the following:

- RCRA-regulated units, such as container storage areas, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, and underground injection wells
- Closed and abandoned units
- Recycling units, wastewater treatment units, and other units that EPA has usually exempted from standards applicable to hazardous waste management units
- Areas contaminated by routine and systematic releases of wastes or hazardous constituents. Such areas might include a wood preservative drippage area, a loading or unloading area, or an area where solvent used to wash large parts has continually dripped onto soils.

An AOC is defined as any area where a release of hazardous waste or constituents to the environment has occurred or is suspected to have occurred on a nonroutine and nonsystematic basis. This includes any area where a strong possibility exists that such a release might occur in the future.

The purpose of the PA is as follows:

- Identify SWMUs and AOCs at the facility
- Obtain information on the operational history of the facility
- Obtain information on releases from any units at the facility
- Identify data gaps and other informational needs to be filled during the VSI

The PA generally includes review of all relevant documents and files located at state offices and at the EPA Region 5 office in Chicago.

The purpose of the VSI is as follows:

- Identify SWMUs and AOCs not discovered during the PA
- Identify releases not discovered during the PA
- Provide a specific description of the environmental setting
- Provide information on release pathways and the potential for releases to each medium
- Confirm information obtained during the PA regarding operations, SWMUs, AOCs, and releases

The VSI includes interviewing appropriate facility staff; inspecting the entire facility to identify all SWMUs and AOCs; photographing all visible SWMUs; identifying evidence of releases; making a preliminary selection of potential sampling parameters and locations, if needed; and obtaining additional information necessary to complete the PA/VSI report.

This report documents the results of a PA/VSI of the Ford Motor Company - Sterling Axle Plant (FMC) facility (EPA Identification No. MID 044 255 420) in Sterling Heights, Macomb County,

Michigan. The PA was completed on June 17, 1993. PRC gathered and reviewed information from the Michigan Department of Natural Resources (MDNR), the Federal Emergency Management Agency (FEMA), the National Oceanic and Atmospheric Administration (NOAA), the National Wetlands Inventory (NWI), the U.S. Department of Agriculture (USDA), the U.S. Department of Commerce (U.S. DOC), the U.S. Geological Survey (USGS), and from EPA Region 5 RCRA files. The VSI was conducted on June 22, 1993. It included interviews with facility representatives and a walk-through inspection of the facility. PRC identified 10 SWMUs and 2 AOCs at the facility.

The VSI is summarized and 10 of the 15 inspection photographs are included in Appendix A. The photographs have been renumbered; thus, their numbers differ from the photograph numbers in the VSI field notes, which are included in Appendix B. An analytical report on the mixture of waste lapping compound and fly ash is included in Appendix C.

2.0 FACILITY DESCRIPTION

This section describes the facility's location; past and present operations; waste generating processes and waste management practices; history of documented releases; regulatory history; environmental setting; and receptors.

2.1 FACILITY LOCATION

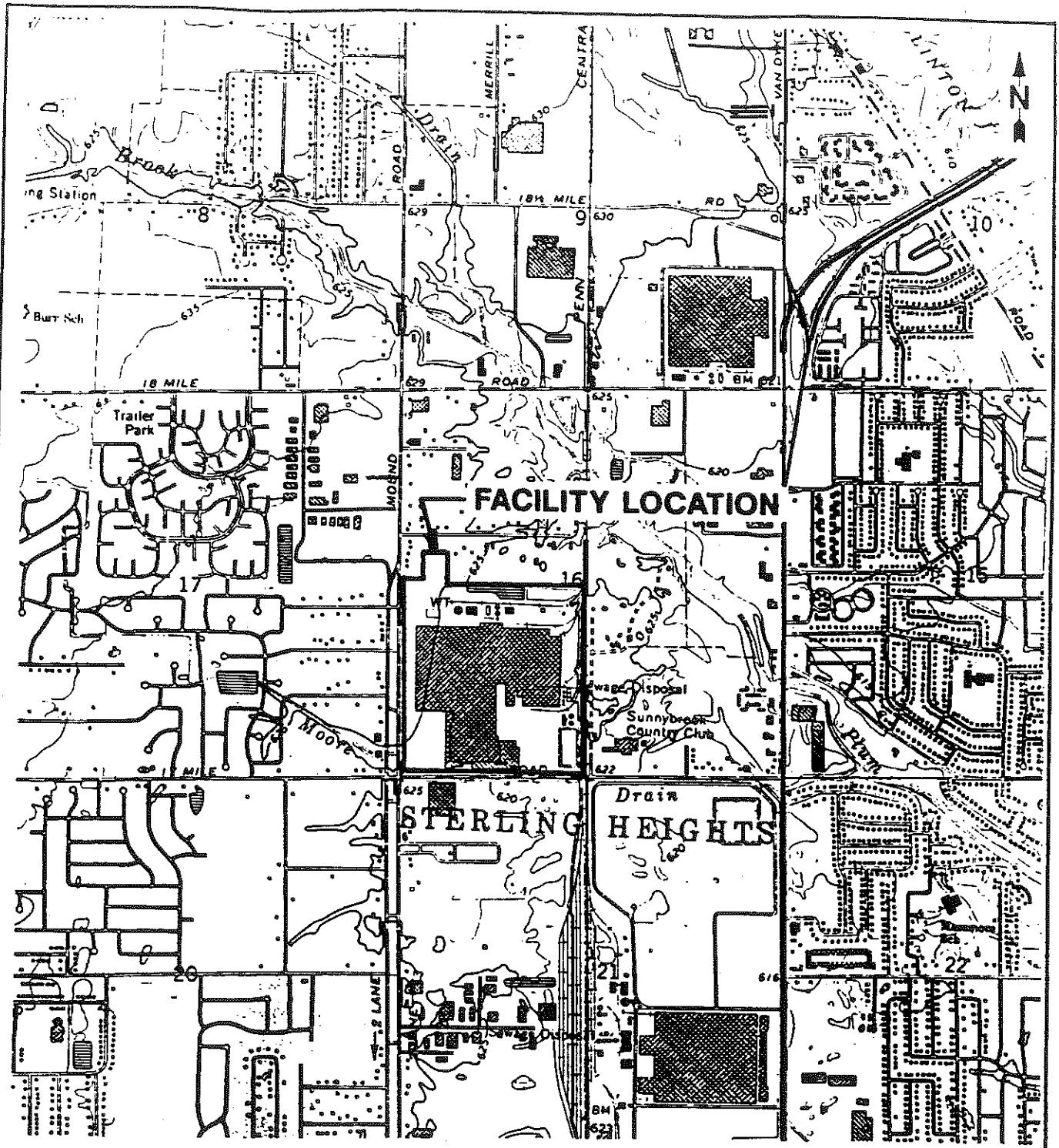
The FMC facility is located at 39000 Mound Road in Sterling Heights, Macomb County, Michigan (latitude 42°35'03"N and longitude 83°02'45"W), as shown in Figure 1. The facility occupies 155.5 acres in a light industrial area in the City of Sterling Heights. The facility is bordered on the east by a golf course, on the north and the south by light industrial areas, and on the west by residences.

2.2 FACILITY OPERATIONS

The FMC facility manufactures rear axles and drive shafts for automobiles. According to a facility representative, the facility was built in 1955 by FMC and the manufacturing operations at the facility began in 1956. The facility has been owned and operated by FMC since 1955. Prior to 1955, the site was used as farmland.

FMC's operations are located on 155.5 acres. The facility comprises a manufacturing building, a power house, a salvage building, a new tank farm, an old tank farm, a Wastewater Treatment System (WWTS) (SWMU 5), an Inactive WWTS (SWMU 6), and a Storm Water Retention Pond (SWMU 10). The tank farm and the WWTS were built in 1992. The southern part of the manufacturing building was built in 1966. The manufacturing building has a floor area of 2,100,000 square feet which includes 500,000 square feet of office space in its western part. The facility currently has about 3,000 employees and operates on 3 shifts, 7 days per week. In 1983, the facility had about 9,000 employees.

FMC's manufacturing building has three areas which the facility refers to as Areas A, B, and C. In Area A, the facility manufactures rings and pinions. To manufacture rings and pinions, the facility receives forged steel from off-site sources and machines, heat treats, and laps them on site. In

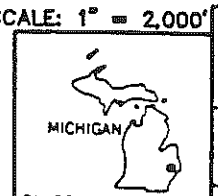


SCALE 1:24000

1 0 1/2 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

SCALE: 1" = 2,000'



QUADRANGLE LOCATION

FORD MOTOR COMPANY
STERLING AXLE PLANT
STERLING HEIGHTS, MICHIGAN

FIGURE 1
FACILITY LOCATION

PRC ENVIRONMENTAL MANAGEMENT, INC.

SOURCE: MODIFIED FROM USGS, WARREN, MICHIGAN, QUADRANGLE, 1983 (PHOTOREVISED 1980)

the lapping process, the facility pastes rings and pinions with oil and fine-grained silica. In Area B, the facility manufactures carriers from steel tubes. A carrier is a container that houses gears and bearings in the rear axle of automobiles. In manufacturing the carriers, the facility receives steel castings from off-site sources and machines, heat treats, and presses them on site. In Area C, the facility manufactures finished axle shafts from raw axle shafts, which are received from off-site sources. The raw axle shafts are machined and heat treated on site.

In 1985, the facility chrome treated aluminum wheels on site on an experimental basis. According to the facility representatives, the quality of the final product was unsatisfactory and the operation ceased.

The facility operates an on-site power house which is located north of the manufacturing building. The power house was built in 1955 and has a floor area of about 20,000 square feet. It houses FMC's boilers which generate power to heat the facility. The boilers are fueled by coal. However, according to a facility representative, after July 1993, FMC will use natural gas to fuel its boilers (PRC 1993a).

FMC's salvage building, which is located north of the manufacturing building, was built in 1955 and has a floor area of about 8,000 square feet. This building stores facility hazardous and nonhazardous wastes.

The facility has a new aboveground tank farm, which was to begin operations in July 1993 and an old tank farm which began operations in 1956. Both tank farms are located outside the northwestern part of the manufacturing building. At the time of the VSI, the facility was in the process of phasing out the old tank farm. The old tank farm contains 10 aboveground storage tanks and five empty underground storage tanks (UST). The five USTs have been empty since December 1990. A release of oil was documented at the location of the USTs in 1992 and PRC has identified this location as an AOC (AOC 2). At the time of the VSI, the five empty USTs had not been removed from their original location. The USTs are made of steel. Two of the USTs have capacities of 20,000 gallons each and three have capacities of 12,000 gallons each. The USTs stored virgin lubricating oil, hydraulic oil, cutting oil, and soluble oil. The 10 aboveground tanks range in capacity from 2,000 to 25,000 gallons. At the time of the VSI, the aboveground tanks were storing virgin oils.

The facility stored leaded and unleaded gasolines on site in a 15000-gallon steel UST at different time periods between 1978 and 1990. The UST was located outside the southeastern part of the manufacturing building. The facility had the UST removed in May 1991. The location of the UST was backfilled with soil, and at the time of the VSI, the ground surface was paved with concrete. A release of gasoline was documented at the location of the UST in 1991 and PRC has identified this location as an AOC (AOC 1).

The FMC facility operates a WWTS (SWMU 5) on site. This plant is located outside the east end of the manufacturing building. The WWTS treats process wastewater generated at the facility. An Inactive WWTS (SWMU 6) is located north of the WWTS (SWMU 5). SWMU 6 was in operation from 1956 to December 1992 when a new WWTS (SWMU 5) began operation.

The facility has a Storm Water Retention Pond (SWMU 10) in the southeast corner of its property. This SWMU has a capacity of 12 million gallons (PRC 1993a). It receives storm water runoff from throughout the facility. The facility separates soluble and floating oils from the waters that accumulate in this SWMU and discharges the water to the nearby Moore Drain.

2.3 WASTE GENERATION AND MANAGEMENT

This section describes waste generation and management at the FMC facility. The facility's SWMUs are identified in Table 1. The facility layout, including SWMUs and AOCs, is shown in Figure 2. The facility's waste streams are summarized in Table 2.

The FMC facility generates or manages four hazardous and seven nonhazardous waste streams at this facility. In addition, the facility has generated and managed two hazardous waste streams in the past. Hazardous wastes streams currently generated or managed at the facility include the following: waste petroleum naphtha (D001, D018, and D039), spent paint (F005), spent toner (F002), and waste hexane (D001). Hazardous waste streams generated and managed in the past include obsolete laboratory chemicals (D002, D006, U044, U188, and U196) and waste chromium-bearing solution (D007). Nonhazardous waste streams currently generated or managed at the facility include polychlorinated biphenyl (PCB)-bearing waste transformer oil, waste steel transformer units, wastewater, waste oil, metal chips, waste lapping compound, and fly ash.

TABLE 1

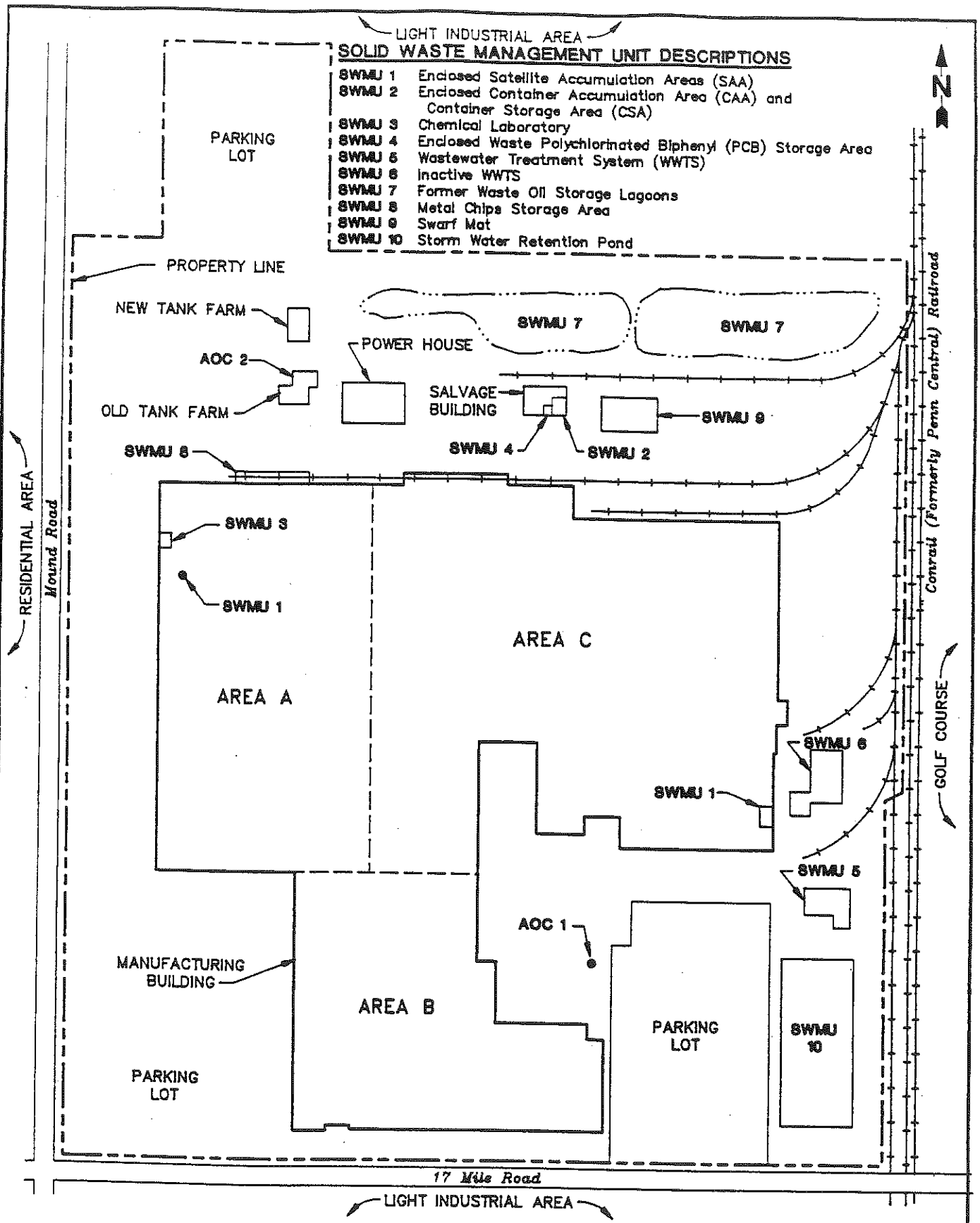
SOLID WASTE MANAGEMENT UNITS

SWMU Number	SWMU Name	RCRA Hazardous Waste Management Unit[a]	Status
1	Enclosed Satellite Accumulation Areas (SAA)	No	Active; accumulates hazardous waste
2	Enclosed Container Accumulation Area (CAA) and Container Storage Area (CSA)	No[b]	Active; accumulates hazardous waste for less than 90 days
3	Chemical Laboratory	No	Active; accumulates hazardous waste
4	Enclosed Waste PCB Storage Area	No	Active; accumulates nonhazardous waste
5	WWTS	No	Active; accumulates nonhazardous waste
6	Inactive WWTS	No	Inactive since December 1992; accumulated nonhazardous waste prior to December 1992
7	Former Waste Oil Storage Lagoons	No	Closed; nonhazardous sludge removed and the cavity backfilled with soil in 1986
8	Metal Chips Storage Area	No	Active; accumulates nonhazardous waste
9	Swarf Mat	No	Active; accumulates nonhazardous waste
10	Storm Water Retention Pond	No	Active; accumulates nonhazardous waste

Notes:

[a] A RCRA hazardous waste management unit is one that currently requires or formerly required submittal of a RCRA Part A or Part B permit application.

[b] This unit stored hazardous wastes for more than 90 days. The issue of the more-than-90-day storage has been resolved by MDNR and is discussed further in Section 2.5 of this PA/VSI report.



AREA OF CONCERN DESCRIPTIONS

AOC 1 Location of 1991 Gasoline Release
AOC 2 Location of 1992 Oil Release

200' 0 200' 400'
SCALE: 1" = 400'

SOURCE: MODIFIED FROM FORD MOTOR COMPANY SKETCH RECEIVED JUNE 22, 1993

FORD MOTOR COMPANY
STERLING AXLE PLANT
STERLING HEIGHTS, MICHIGAN

FIGURE 2
FACILITY LAYOUT

ENVIRONMENTAL MANAGEMENT, INC.

FORDAX

1 - 11/05/93 - RAQ - 309-R05032M54

TABLE 2

SOLID WASTES

Waste/EPA Waste Code[a]	Source	Solid Waste Management Unit
Waste petroleum naphtha/D001, D018, and D039	Parts washing	None[c]
Spent paint/F005	Facility maintenance	1 and 2
Spent toner/F002	Maintenance of photocopiers	1 and 2
Waste hexane/D001	Testing products	2 and 3
Obsolete laboratory chemicals[b]/D002, D006, U044, U188, and U196	Obsolete chemicals disposed of as waste	3
Waste chromium-bearing solution[b]/D007	Aluminum wheel production	2
Waste PCB-bearing oil/NA	Phasing out of PCB-bearing transformers	4
Waste steel transformer units/NA	Phasing out of PCB-bearing transformers	None[c]
Wastewater/NA	Wastewater treatment	5, 6, and 7
Waste oil/NA[d]	Wastewater treatment	5, 6, 7, 8, 9, and 10
Metal chips/NA	Machining and cutting of metal	8
Waste lapping compound/NA	Ring and pinion lapping	9
Fly ash/NA	Burning coal	9

Notes:

[a] Not applicable (NA) designates a RCRA nonhazardous waste.

[b] This waste is no longer generated.

[c] "None" indicates that the waste stream is not managed on site.

[d] EPA initially identified the sludge component of this waste as hazardous and designated it F006 RCRA waste code. In 1986, at FMC's request, an EPA administrative law judge ruled this waste was nonhazardous.

The facility routinely generates hazardous wastes on site and accumulates them in two Enclosed Satellite Accumulation Areas (SAA) (SWMU 1), an Enclosed Container Accumulation Area (CAA) and Container Storage Area (CSA) (SWMU 2), and a Chemical Laboratory (SWMU 3) for less than 90 days. However, in 1985, the facility stored two hazardous wastes in SWMU 2 for more than 90 days.

Waste petroleum naphtha (D001, D018, and D039) is generated by washing machine parts throughout the manufacturing area of the facility. The facility uses about 100 parts washers with 20- and 30-gallon capacities. The facility generates the waste at a rate of about 1,000 gallons per month, but does not manage the waste on site. FMC has a contract with Safety-Kleen Corporation (Safety-Kleen) of Elgin, Illinois, to deliver the 20- and 30-gallon drums of virgin petroleum naphtha to the facility and to pick up the waste petroleum naphtha when needed. Safety-Kleen transports the waste petroleum naphtha to its facility in Pontiac, Michigan (EPA ID No. MID 000 722 686), where it is recycled.

Spent paint (F005) is generated by maintenance-related painting work conducted in the facility paint shop located in the eastern part of the manufacturing building. The facility generates about 50 gallons of waste paint per month. The facility accumulates the waste in a 55-gallon drum in the Enclosed SAA (SWMU 1). When full, the facility moves the drum to the Enclosed CAA and CSA (SWMU 2) for less-than-90-day accumulation. The waste is removed periodically by Safety-Kleen to its facility in Pontiac, Michigan, where it is fuel blended.

Spent toner (F002) is generated when toner fluid in facility photocopiers is replaced. These photocopiers are located throughout the office areas of the manufacturing building. FMC generates this waste at a rate of about 2 gallons per month. FMC accumulates waste toner in a 55-gallon drum in the Enclosed SAA (SWMU 1) in the northwestern part of Area A and, when full, moves the drum to the Enclosed CAA and CSA (SWMU 2) for storage. The waste is removed periodically by Safety-Kleen to its facility in Pontiac, Michigan, where it is fuel blended.

Waste hexane (D001) is generated by the facility laboratory during the testing of rings and pinions to meet FMC's quality control requirements. The facility generates the waste at a rate of about 5 gallons per month and accumulates it in a 30-gallon drum in the Chemical Laboratory (SWMU 3). When the drum is full, the facility removes it to the Enclosed CAA and CSA (SWMU 2) for less-

than-90-day accumulation. Waste hexane (D001) is removed periodically from SWMU 2 by Safety-Kleen to its facility in Pontiac, Michigan, where it is fuel blended.

Obsolete laboratory chemicals (D002, D006, U044, U188, and U196) were generated and managed in 1990 in the Chemical Laboratory (SWMU 3) when virgin sodium hydroxide, cadmium chloride, chloroform, phenol, and pyridine became obsolete and were removed to an off-site location as waste (MDNR 1990). The generation of this waste was a one-time occurrence. Information on the amount of obsolete laboratory chemicals generated at the facility is not available. The waste was removed to the Rollins Environmental, Inc. (REI), facility in Deer Park, Texas (EPA ID No. TXD 055 141 378), for incineration.

Waste chromium-bearing solution (D007) was generated during production of aluminum wheels when the wheels were rinsed in a chromium-bearing solution. FMC conducted this operation on an experimental basis in 1985, and discontinued it because the final product was unsatisfactory. The generation of this waste was a one-time occurrence. The facility stored waste chromium-bearing solution (D007) in 55-gallon drums in the Enclosed CAA and CSA (SWMU 2). A RCRA compliance inspection conducted by MDNR in 1985 revealed that FMC had stored this waste in SWMU 2 for 5 months (MDNR 1985b). During this inspection, MDNR inspectors documented an additional seven 55-gallon drums of waste chromium-bearing solution (D007) in SWMU 2 that did not have an accumulation start date. Information on the volume, removal, and further handling of this waste stream is not available.

Waste PCB-bearing transformer oil, a nonhazardous waste under RCRA, is generated by a gradual phasing out of PCB-bearing transformers at the facility. According to facility representatives, FMC first generated the waste in 1982. In December 1992, the last time the PCB-bearing transformers were replaced, the facility generated 2,400 gallons of the waste by phasing out eight PCB-bearing transformers. The facility empties the PCB-bearing transformer oil into 55-gallon drums and stores them in the Enclosed Waste PCB Storage Area (SWMU 4) located in the salvage building of the facility. The waste is hauled away by Unison Transformer Services, Inc. (Unison), of Ashtabula, Ohio, to the REI facility in Deer Park, Texas, for incineration.

Waste steel transformer units, a nonhazardous waste, are also generated by a gradual phasing out of PCB-bearing transformers at the facility. FMC first generated this waste in 1982. In 1992, the

facility generated eight waste transformer units weighing about 5 tons total (PRC 1993a). FMC does not manage the waste on site. After draining the PCB-bearing oil, the units are hauled away by Unison to its facility in Ashtabula, Ohio, for recycling.

Wastewater, a nonhazardous waste, is generated by the treatment of the facility process wastewater. The waste is managed in the WWTS (SWMU 5). Prior to December 1992, the wastewater was managed in the Inactive WWTS (SWMU 6). From 1970 to 1986, some wastewater, which was mixed with the waste oil, was also managed in the Former Waste Oil Storage Lagoons (SWMU 7). According to the facility representatives, FMC generates the wastewater at a rate of about 600,000 gallons per day. The wastewater is piped to the publicly owned treatment works (POTW) in Detroit, Michigan.

Waste oil, a nonhazardous waste, is generated by on-site treatment of oil-bearing process wastewater and storm water, and by the breakdown of the waste lapping compound. The waste oil generated by the treatment of the oil-bearing wastewater also contains some sludge. Waste oil is mixed with facility process wastewater, which is routed to the WWTS (SWMU 5) through floor drains in the manufacturing building. According to facility representatives, waste oil constitutes about 4 to 7 percent of the process wastewater. Waste oil is also drained from the Metal Chips Storage Area (SWMU 8) to the WWTS (SWMU 5) for treatment and storage. Some waste oil, mixed with storm water, is also skimmed from the Storm Water Retention Pond (SWMU 10) and is moved to the WWTS (SWMU 5) by FMC's trucks for treatment. Prior to December 1992, the facility generated and managed waste oil in the Inactive WWTS (SWMU 6). A waste oil component also separates from the waste lapping compound and floats on top of the waste in the Swarf Mat (SWMU 9). Prior to 1986, the facility managed the waste oil in the Former Waste Oil Storage Lagoons (SWMU 7) located at the northern part of the facility. The sludge component of the waste oil contained manganese phosphate. According to a facility representative, sometime before 1983, EPA identified the sludge component as hazardous and assigned it F006 RCRA waste code (PRC 1993c). In 1983, FMC filed a petition with EPA to delist the sludge because, according to FMC, the sludge did not exhibit any hazardous characteristics (FMC 1983). In 1986, EPA approved FMC's petition (EPA 1986). According to facility representatives, FMC discontinued discharging waste oil to SWMU 7 in 1980. Since 1980, the facility has been sending waste oil to the Edwards Oil, Inc. (Edwards Oil), facility in Detroit, Michigan, for recycling and fuel blending. In 1986, the facility removed the sludge-bearing waste oil from SWMU 7 to the Wayne Disposal, Inc. (Wayne Disposal), facility in

Belleville, Michigan, where it was landfilled. According to facility representatives, the facility generates waste oil at a rate of about 500,000 gallons per year.

Metal chips, a nonhazardous waste, are generated by cutting steel parts in different areas throughout the manufacturing building. The chips are moved to the Metal Chips Storage Area (SWMU 8) through conveyor belts in the manufacturing building. The metal chips are stored in railroad cars in SWMU 8 where they are de-oiled. De-oiling is done by allowing the waste oil to drip down from the metal chips to the waste oil drain where the waste oil flows to SWMU 5 for treatment and storage. According to facility representatives, FMC generates metal chips at a rate of about 29,000 tons per year. The metal chips are hauled away by Zalev Brothers, Limited, of Windsor, Ontario, to the Cleveland Casting, Inc. facility in Cleveland, Ohio, for recycling.

Waste lapping compound, a nonhazardous waste, is generated by a lapping process in which a compound made by mixing mineral oil with fine-grained silicon carbonate is pasted onto rings and pinions in Area A of the manufacturing building. The waste occurs as a slurry. After lapping a batch of rings and pinions, FMC removes the waste lapping compound by facility trucks from the manufacturing building to the Swarf Mat (SWMU 9) for solidification and storage. The facility solidifies the waste in SWMU 9 by mixing it with fly ash, which is also generated on site. The facility representatives presented PRC inspectors with an analytical report generated by National Environmental Testing, Inc. (NET), of Auburn Hills, Michigan, on the mixture of waste lapping compound and fly ash. A copy of the report is included in Appendix C. FMC generates the waste lapping compound at a rate of about 500 gallons per week. The solidified waste is removed by Calverts Rolloff Containers, Inc. (Calverts), of Ann Arbor, Michigan, and hauled to Allen Park Clay Mine in Allen Park, Michigan, where it is landfilled. According to facility representatives, after July 1993, the waste lapping compound will be picked up by Michigan Disposal, Inc. (Michigan Disposal), of Belleville, Michigan, and will be solidified and disposed of at the Michigan Disposal facility in Belleville, Michigan.

Fly ash, a nonhazardous waste, is generated from burning coal to operate on-site boilers in FMC's power house. The facility periodically cleans the boilers and collects the fly ash in a truck and moves it to the Swarf Mat (SWMU 9) where it is used to solidify the facility's waste lapping compound when the two compounds are mixed together. The solidified waste is hauled by Calverts of Ann Arbor, Michigan, to Allen Park Clay Mine in Allen Park, Michigan, where it is landfilled. FMC

generates fly ash at an average rate of 20 cubic yards per week (PRC 1993a). According to a facility representative, after July 1993, FMC will no longer generate fly ash because the facility will use natural gas to fuel its boilers (PRC 1993a).

2.4 HISTORY OF DOCUMENTED RELEASES

This section discusses the history of documented releases to groundwater and on-site soils at the facility.

From 1967 to 1986, FMC stored nonhazardous waste oil in the Former Waste Oil Storage Lagoons (SWMU 7). The waste oil also contained some sludge and wastewater. These lagoons, referred to as the western and eastern lagoons, were located in pits excavated on the ground. According to a facility representative, FMC did not put any liner between the sludge and the ground surface (PRC 1993a). Therefore, release of waste oil and wastewater to on-site soils occurred between 1967 and 1986. In 1986, the facility removed the waste oil to an off-site facility and backfilled the lagoons with visually clean soil. However, after the removal of the waste oil, the facility did not analyze the soils from SWMU 7 to show that all on-site soils impacted by the release had been removed.

In May 1991, a release of gasoline from a 15000-gallon steel UST and from an adjacent gasoline dispenser island to on-site soils and groundwater was documented. The release was documented during the removal of the UST by FMC's contractor, Hubbel, Roth, and Clark, Inc. (HRC), of Bloomfield Hills, Michigan, when a volatile organic analyzer (VOA) detected a volatile organic compound (VOC) level of 3 parts per million (ppm) from a subsurface soil sample (HRC 1991b). The UST had stored leaded and unleaded gasolines during different time periods between 1978 and 1990. The facility had the UST removed to an off-site location for scrap metal. HRC excavated 730 cubic yards of the impacted soil from the location of the removed UST and stockpiled it on a paved parking lot on site. HRC backfilled the UST cavity with visually clean soil. HRC also documented about 1 gallon of water located beneath the removed UST and interpreted it as groundwater that had perched on an underlying low-permeability clay layer (HRC 1991b). HRC collected 20 soil samples and one groundwater sample for benzene, toluene, ethylbenzene, and xylene (BTEX); methyl tertiary butyl ether (MTBE); and lead analysis. Analytical data showed that the soil samples had BTEX, MTBE, and lead contents below the soil cleanup levels defined by the Michigan Environmental Response Act (Michigan Act) 307 (HRC 1991b). The perched groundwater sample showed BTEX

compounds at elevated levels. In December 1991, the excavated soil, which was stockpiled at the facility, was hauled away to the Wayne Disposal facility in Belleville, Michigan, for landfilling. In January 1992, HRC installed a groundwater monitoring well about 10 feet north of the location of the removed UST and collected groundwater samples for analysis. FMC did not submit the analytical data on the groundwater from the monitoring well to any regulatory agency for review and consideration of the need for further remediation (PRC 1993c).

In February 1992, the facility documented a release of virgin oil to on-site soils. This release occurred from one or more of the five USTs in the old tank farm located outside the northwestern area of the manufacturing building. Information on the quantity of the released oil is not available. At the time of the VSI, the impacted soil and the empty USTs had not been excavated and the facility was following a remediation schedule set in an MDNR-approved remediation action plan (HRC 1991a). In order to complete the removal, the facility must demolish a building located in the old tank farm because some of the empty USTs are partially located underneath the building.

2.5 REGULATORY HISTORY

FMC is currently regulated as a large-quantity generator (LQG) of hazardous waste. The facility currently accumulates hazardous wastes for less than 90 days. FMC submitted a Notification of Hazardous Waste Activity form to EPA on August 14, 1980 (FMC 1980). In this notification, FMC identified itself as a generator of and a treatment, storage, and disposal (TSD) facility for hazardous wastes. This notification listed F001, F003, F010, F012, F018, P030, P106, U013, U044, U225, and U228 waste codes. In March 1981, FMC wrote to EPA that the facility did not operate as a TSD facility and should be regulated only as a generator of hazardous wastes (FMC 1981). According to facility representatives, FMC never filed a RCRA Part A permit application.

In August 1983, FMC filed a petition with EPA for delisting its sludge-bearing waste oil. The sludge component contains manganese phosphate (FMC 1983). According to a facility representative, EPA had classified the sludge as a listed hazardous waste with F006 RCRA waste code (PRC 1993c). In the petition for delisting, FMC stated that the sludge did not have any hazardous characteristics and that it did not contain any hazardous constituents. FMC managed the sludge in the two Former Waste Oil Storage Lagoons (SWMU 7) in the northern part of the facility. In August 1986, EPA issued a Final Order which stated that FMC's sludge-bearing waste oil was nonhazardous

(EPA 1986). In this Order, EPA referred to a precedent set by the U.S. Nameplate Company decision of March 31, 1986.

MDNR conducted RCRA compliance inspections at the facility in 1984 and 1985. During these inspections, MDNR considered the waste oil as a RCRA-regulated hazardous waste and described the Former Waste Oil Storage Lagoons (SWMU 7) as surface impoundments because at the time of these inspections, FMC's petition to delist the sludge had not been approved. As a result of the 1984 inspection, EPA filed an Administrative Complaint for the following: storing the waste oil in a surface impoundment and without having achieved interim status; failing to implement a RCRA groundwater monitoring system; not having a closure plan for the surface impoundments; and for not properly labeling hazardous waste containers (EPA 1984). There is no record on file to show whether FMC responded to the Administrative Complaint, but its petition for delisting the sludge-bearing waste oil was later approved.

During the 1985 inspection, the facility was cited for violations pertaining to the following: storing hazardous wastes for more than 90 days in the Enclosed CAA and CSA (SWMU 2); for managing waste oil in the Former Waste Oil Storage Lagoons (SWMU 7); and for not having start accumulation dates on containerized wastes (MDNR 1985b). The facility had stored waste chromium-bearing solution (D007) for 5 months and an unnamed waste with D001 RCRA waste code for 7 months. FMC responded by submitting a compliance program to MDNR and MDNR approved the program (MDNR 1985c).

In January 1985, in a follow-up of the 1984 Administrative Complaint, MDNR asked FMC to submit a closure plan for the Former Waste Oil Storage Lagoons (SWMU 7) (MDNR 1985a). In April 1985, FMC submitted a closure plan for SWMU 7 (FMC 1985).

In September 1985, after three amendments and the expiration of a 30-day public comment period, EPA approved the closure plan (EPA 1985a). In early October 1985, the facility began removing the waste oil from SWMU 7. As part of the waste oil removal project, FMC also retained Neyer, Tiseo, and Hindo, Ltd. (NTH), a consulting firm based in Farmington Hills, Michigan, to investigate groundwater conditions at the facility with regard to any past releases from the sludge stored in SWMU 7. Between December 1985 and March 1986, NTH drilled 13 soil boreholes and installed four piezometers and one observation well. This work represented the first two phases of a three-

phase project (NTH 1986). According to the records on file, NTH did not complete the third phase of the hydrogeological investigation project because in June 1986 FMC filed a motion to dismiss the EPA Administrative Complaint on the basis of the U.S. Nameplate Company decision of March 31, 1986. In June 1986, the closure activities at SWMU 7 ceased. According to a facility representative, all waste oil from SWMU 7 had been removed by June 1986 (PRC 1993c).

In December 1985, EPA issued a Consent Agreement and Final Order to FMC with regard to corrective actions at the Former Waste Oil Storage Lagoons (SWMU 7) (EPA 1985b). FMC, through its lawyers, returned the Consent Agreement and Final Order unsigned, claiming that FMC was not subject to RCRA's hazardous waste TSD facility regulations (H and W 1986).

The FMC facility currently maintains 39 air permits. These permits are for heaters, ovens, and boilers. No violations of air permits are known to have occurred (PRC 1993a). The facility has an NPDES permit to discharge noncontact cooling water and storm water from the Storm Water Retention Pond (SWMU 10). The permit calls for limits on the oil and grease content, turbidity, sheen, and the volume of the effluent (PRC 1993a). The outfall is located at the southeastern corner of SWMU 10 which is where the effluent is discharged to Moore Drain. No violations of the NPDES permit are known to have occurred (PRC 1993a). The facility has a permit from the Detroit Water and Sewer Department (DWSD) for the discharge of pretreated wastewater from the WWTS (SWMU 5) and the Inactive WWTS (SWMU 6) to the local POTW.

No CERCLA activities have taken place at the FMC facility. In May 1991, FMC removed a 15000-galion steel UST in which it had stored leaded and unleaded gasolines during different time intervals between 1978 and 1990. At the time of the VSI, the facility was in the process of removing five additional USTs from its old tank farm in accordance with a plan approved by MDNR (HRC 1991a). In these USTs, the facility had stored virgin hydraulic, cutting, and lubricating oils between 1956 and 1990. Documented releases from the USTs are described in Section 2.4 of this report.

2.6 ENVIRONMENTAL SETTING

This section describes the climate; flood plain and surface water; geology and soils; and groundwater in the vicinity of the facility.

2.6.1 Climate

The climate in Macomb County is temperate. The average daily temperature is 48 °F. The lowest average daily temperature is 16 °F in January. The highest average daily temperature is 83 °F in July (NOAA 1990).

The total annual precipitation for the county is about 31 inches (Larson 1971). The mean annual lake evaporation is about 30 inches (U.S. DOC 1983). The 1-year, 24-hour maximum rainfall was about 3.7 inches in December 1965 (NOAA 1990).

The prevailing wind is from the southwest. Average wind speed is highest in January at 12 miles per hour from the west-southwest (NOAA 1990).

According to NOAA, the climate of Macomb County is influenced by its close proximity to major storm tracks and the Great Lakes. The normal wintertime storm track is south of the county, which brings combinations of rain, snow, freezing rain, and sleet with heavy snowfall accumulations. In summer, most storms pass to the north allowing for intervals of warm, humid, sunny skies with occasional thunderstorms followed by days of mild, dry, and fair weather. Temperatures of 90 °F or higher are reached during each summer (NOAA 1990).

Northwest winds in winter bring snow accumulations to Macomb County and surrounding areas. Summer showers moving from the northwest weaken and sometimes dissipate as they approach Detroit. On the other hand, much of the heaviest precipitation in winter comes from southeast winds, especially to the northwest suburbs of the city (NOAA 1990).

The growing season averages 180 days and has ranged from 145 days to 205 days. On average, the last freezing temperature occurs in late April while the average first freezing temperature occurs in

late October. A freeze has occurred as late as mid-May and as early as late September (NOAA 1990).

2.6.2 Flood Plain and Surface Water

The FMC facility does not lie in a 100-year flood plain (FEMA 1981).

Two wetlands, the Former Waste Oil Storage Lagoons (SWMU 7) and the Storm Water Retention Pond (SWMU 10), are located on site (NWI 1978).

The nearest surface water body, Moore Drain, is located 300 feet south of the facility and is not used for recreational, agricultural, industrial, or municipal water supply purposes. Moore Drain flows toward the south and merges into Plum Brook, about 0.75 mile southeast of the facility. Plum Brook, in turn, merges into the Clinton River, which empties into Lake St. Claire. Plum Brook is used for recreational purposes (PRC 1993d).

The surface runoff from the facility collects in the Storm Water Retention Pond (SWMU 10) located at the southeastern corner of the facility. The facility collects floating oils in SWMU 10 and releases the water to Moore Drain. The facility has an NPDES permit for this discharge.

2.6.3 Geology and Soils

The area around the FMC facility is underlain by Devonian-aged bedrock and Pleistocene-aged unconsolidated glacial deposits. In a 3-mile radius of the facility, the glacial deposits are up to 200 feet thick. These deposits consist of a cohesive till unit which includes sand and gravel layers of varying thicknesses (MDNR 1993). About 3 miles northwest of the facility, the till unit is overlain by a sand deposit which is an ancient delta of the Clinton River. At the FMC facility, this till unit consists of a silty clay layer which is over 35 feet thick (NTH 1986).

The bedrock under the FMC facility includes Berea Sandstone and Antrim Shale. The Berea Sandstone is found at a depth of between 120 and 140 feet below ground surface (bgs) and is at least 50 feet thick. The Antrim Shale lies at a depth of at least 180 feet bgs (NTH 1986).

2.6.4 Groundwater

The following summary of the groundwater conditions at and around the FMC facility is from a report by NTH (NTH 1986).

The area around the facility is underlain by a water table aquifer, two artesian aquifers within the cohesive till unit, and a bedrock aquifer. Each of these aquifers is described below.

The water table aquifer occurs in a post glacial deltaic deposit located to the northwest of the facility. This deposit consists of coarse sands and gravel and is locally used as a source of water supply. Groundwater within this aquifer occurs under unconfined conditions. The deltaic deposit is between 30 and 40 feet thick and has water levels generally 10 feet bgs. This aquifer is not present in the immediate vicinity of the FMC facility.

The upper and lower artesian aquifers are found within the cohesive till unit. The upper artesian aquifer (that is, sand layers) is variable with respect to thickness and depth. In addition, this unit is believed to be discontinuous throughout the Sterling Heights area. This aquifer, where found, is encountered between 60 and 90 feet bgs and is approximately 5 to 15 feet thick. In most cases, the overlying unit is the cohesive till unit. This tends to isolate this aquifer from activities at the ground surface. Water levels in wells which tap the upper artesian aquifer are generally between 20 and 40 feet bgs.

The lower artesian aquifer is generally found directly above the bedrock surface at a depth of between 100 and 120 feet bgs. This aquifer is believed to be discontinuous and varies from 5 to 10 feet in thickness. Water levels in wells which tap this aquifer range from 10 to 20 feet bgs.

The bedrock aquifer consists of the Devonian-aged Berea Sandstone and the Antrim Shale. The water levels in wells which penetrate this bedrock unit are within 10 feet of the ground surface and in some instances, are flowing. The Antrim Shale is occasionally used as a source of water supply in those areas where the rock is fractured or weathered. The water level within the Antrim Shale is approximately 35 feet bgs.

Groundwater observations at the facility show that the top of the zone of saturation is encountered in the cohesive till unit. The water table is at a depth of 3.8 to 13.0 feet bgs. The horizontal groundwater flow direction at the water table is easterly. The horizontal hydraulic gradient through the cohesive soil is approximately 0.008 foot per foot (ft/ft). The vertical gradient is approximately 0.25 ft/ft.

2.7 RECEPTORS

The facility occupies 155.5 acres in a light industrial area in the City of Sterling Heights, Michigan. Sterling Heights has a population of about 117,000 (PRC 1993d). The facility has about 3,000 employees. In 1983, the facility had about 9,000 employees.

The facility is bordered on the north and the south by light industrial areas, on the west by residences, and on the east by a golf course. The nearest residence is located about 500 feet west of the facility. Three schools are located about 1.25 miles northeast, east, and southeast of the facility.

The nearest surface water body, the Moore Drain, is located about 300 feet south of the facility and is not used for recreational, agricultural, industrial, or municipal water supply purposes. Other surface water bodies in the area include the Plum Brook and Clinton River, located about 0.5 mile and 2 miles east of the facility, respectively. Plum Brook is used for recreational purposes (PRC 1993d). Sterling Heights gets its drinking water from Lake St. Claire which is located about 12 miles southeast of the facility (PRC 1993a).

Groundwater is not used as a source of drinking water in the City of Sterling Heights. There are no known groundwater wells in the area except one observation well and four piezometer wells installed by FMC to investigate the groundwater conditions at the facility (HRC 1991a).

Two sensitive environments are located on site. The first sensitive environment comprises the Former Waste Oil Storage Lagoons (SWMU 7) which are palustrine open-water permanent excavated wetlands. The second sensitive environment comprises the Storm Water Retention Pond (SWMU 10) which is a palustrine open-water permanent artificial excavated wetland (NWI 1978).

Access to the facility is via Mound Road. The facility is surrounded by an 8-foot barbed-wire fence and is patrolled by 24-hour security guards.

3.0 SOLID WASTE MANAGEMENT UNITS

This section describes the 10 SWMUs identified during the PA/VSI. The following information is presented for each SWMU: description of the unit, dates of operation, wastes managed, release controls, history of documented releases, and PRC's observations. Figure 2 shows the SWMU locations.

SWMU 1	Enclosed SAAs
Unit Description:	This unit consists of two SAAs each used to accumulate up to 55 gallons of hazardous wastes. The wastes are then transferred to the Enclosed CAA and CSA (SWMU 2). One of the SAAs is located in the northwestern part of Area A and the other one is located in the southeastern part of Area C of the manufacturing building. The 55-gallon drum in Area C of the manufacturing building is stored in a flammable materials storage cabinet.
Date of Startup:	The SAA located in Area A of the manufacturing building began operation in 1988 and the SAA located in Area C began operation in 1956.
Date of Closure:	This unit is active.
Wastes Managed:	This unit manages spent paint (F005) and spent toner (F002) in Areas C and A of the manufacturing building, respectively.
Release Controls:	Both SAAs are located inside the manufacturing building that has brick walls and a concrete floor. The wastes are stored in 55-gallon drums which are kept closed when not in use.
History of Documented Releases:	No releases from this unit have been documented.

Observations:	PRC noted no evidence of release. The containers were in good condition. PRC noted some dark gray stains on the concrete floor of the SAA in Area C of the manufacturing building (see Photograph No. 1).
SWMU 2	**Enclosed CAA and CSA**
Unit Description:	This unit is located inside the salvage building of the facility. It consists of an approximately 30-foot by 20-foot concrete floor. This unit accumulates hazardous wastes in 55-gallon drums located on pallets. The unit accumulates hazardous wastes for less than 90 days.
Date of Startup:	This unit began operation in 1956.
Date of Closure:	This unit is active.
Wastes Managed:	This unit manages spent paint (F005), spent toner (F002), and waste hexane (D001). It also managed waste chromium-bearing solution (D007) in the past.
Release Controls:	This unit is located inside a building that has brick walls and a concrete floor. It is separated from the Enclosed Waste PCB Storage Area (SWMU 4) by a 10-inch-high concrete-filled steel dike. SWMU 2 does not have floor drains.
History of Documented Releases:	No releases from this unit have been documented.
Observations:	The unit contained three 55-gallon drums of spent paint (F005) and one 55-gallon drum of spent toner (F002) during the VSI. PRC noted no evidence of release. The containers were in good condition. PRC noted no cracks in the floor (see Photograph No. 2).

SWMU 3	Chemical Laboratory
Unit Description:	This unit is located at the northwestern part of Area A of the manufacturing building. It consists of a 50-foot by 50-foot room that has a concrete floor and brick walls. In this unit, the facility tests its products and the quality of its supplies. At the time of the VSI, this unit was storing waste hexane (D001) in a 30-gallon drum which was kept in a flammable material storage cabinet.
Date of Startup:	This unit began operation in 1956.
Date of Closure:	This unit is active.
Wastes Managed:	This unit currently manages waste hexane (D001). It also managed obsolete laboratory chemicals (D002, D006, U044, U188, and U196) in the past as a one-time occurrence.
Release Controls:	This unit is located inside a building that has brick walls and a concrete floor.
History of Documented Releases:	No releases from this unit have been documented.
Observations:	During the VSI, this unit contained a 30-gallon drum of waste hexane (D001) stored with same-size drums of products in a flammable material storage cabinet. The drum with hazardous waste was closed during the VSI. PRC noted no evidence of release. PRC noted no cracks in the floor (see Photograph No. 3).

SWMU 4	**Enclosed Waste PCB Storage Area**
Unit Description:	This unit is located inside the salvage building of the facility. It consists of an approximately 15-foot by 15-foot concrete floor. This unit stores waste PCB-bearing oil in 30-gallon drums that rest on a steel grate located on the concrete floor. The unit is located adjacent to the Enclosed CAA and CSA (SWMU 2). It is separated from SWMU 2 by a 10-foot fence and a 10-inch-high concrete-filled steel dike.
Date of Startup:	This unit began operation in 1982.
Date of Closure:	This unit is active.
Wastes Managed:	This unit manages nonhazardous waste PCB-bearing oil.
Release Controls:	This unit is located inside a building that has brick walls and a concrete floor. It is separated from the Enclosed CAA and CSA (SWMU 2) by a 10-inch-high concrete-filled steel dike. It does not have floor drains.
History of Documented Releases:	No releases from this unit have been documented.
Observations:	The unit contained three empty 30-gallon drums during the VSI. PRC noted no evidence of release (see Photograph No. 2).
SWMU 5	**WWTS**
Unit Description:	This unit is located outside the eastern part of the manufacturing building of the facility. The unit includes a building and four aboveground steel tanks. The building has a floor area of about 6,000 square feet and it houses a pumping mechanism for mobilizing

wastewater into the tanks. The four tanks are located outside the building. Three of these tanks have a capacity of 300,000 gallons each and the fourth one has a capacity of 50,000 gallons. Each of the three 300000-gallon tanks treats wastewater by adding calcium chloride for stabilization. A 50000-gallon skimmed oil collection tank collects the waste oil. The pretreated wastewater is piped to the POTW facility in Detroit, Michigan. Wastewater treatment is conducted in batches and the treatment of the wastewater is completed within a single 300000-gallon tank. The skimmed waste oil, which is collected and managed in the 50000-gallon tank, is picked up daily by Edwards Oil of Detroit, Michigan, and taken to its Detroit facility for fuel blending and reclamation.

Date of Startup:	This unit began operation in December 1992.
Date of Closure:	This unit is active.
Wastes Managed:	This unit manages nonhazardous waste oil and wastewater.
Release Controls:	This building of the WWTS has brick walls and a concrete floor. The four steel tanks located outdoors are situated on concrete pads.
History of Documented Releases:	No releases from this unit have been documented.
Observations:	PRC noted no evidence of release. PRC noted no cracks on the floor of the WWTS building. All tanks appeared to be in good condition (see Photograph No. 4).

SWMU 6	Inactive WWTS
Unit Description:	This unit is located outside the eastern part of the manufacturing building. The unit consists of one building and five tanks, which are located outdoors. Two of these tanks are made of concrete and are located below ground. Information on the capacity of the concrete tanks is not available. The remaining three tanks are made of steel and are located above ground. Each of the steel tanks has a capacity of 50,000 gallons. The building houses a pumping mechanism for mobilizing wastewater into the treatment tanks. Wastewater was treated in two of the 50000-gallon steel tanks by adding calcium chloride or iron chloride for stabilization. The wastewater was then routed to the two concrete tanks where oil was separated from the wastewater by skimming. The skimmed waste oil was collected in the third 50000-gallon steel tank where it was picked up daily by Edwards Oil of Detroit, Michigan, and taken to its Detroit facility for fuel blending and reclamation. The pretreated wastewater was piped to the POTW facility in Detroit, Michigan.
Date of Startup:	This unit began operation in 1956.
Date of Closure:	This unit has been inactive since December 1992.
Wastes Managed:	This unit managed nonhazardous waste oil and wastewater.
Release Controls:	The inside of the concrete tanks is coated with epoxy (PRC 1993a). The steel tanks are situated on concrete pads.
History of Documented Releases:	No releases from this unit have been documented.

Observations:	PRC noted no evidence of release. All tanks appeared to be in good condition. The unit was inactive, but one concrete tank contained a dark brown liquid (see Photograph No. 5).
SWMU 7	**Former Waste Oil Storage Lagoons**
Unit Description:	The Former Waste Oil Storage Lagoons are located at the northern end of the facility. These lagoons, referred to as the western and eastern lagoons, are located adjacent to each other and have areas of approximately 2.5 and 3.5 acres, respectively. Both lagoons were excavated to depths of 5 to 13.5 feet (NTH 1986). FMC did not discharge any waste oil in the western and eastern lagoons after 1980 and 1970, respectively (FMC 1985). The waste oil, which also contained some sludge and wastewater, was piped to this unit from the Inactive WWTS (SWMU 6) (PRC 1993b).
Date of Startup:	This unit began operation in 1967.
Date of Closure:	This unit is was closed in 1986 when the facility removed all the waste oil to an off-site facility and backfilled the lagoons with visually clean soil.
Wastes Managed:	This unit managed nonhazardous wastewater and waste oil. The facility discontinued discharging wastewater and waste oil to this unit in 1980.
Release Controls:	The unit had no release controls and the lagoons were not lined.
History of Documented Releases:	Release of wastewater and waste oil to on-site soils occurred between 1967 and 1986 when the facility stored wastes on the ground surface of this unit without using a liner.

Observations:	Wastes from this unit were removed in 1986. PRC noted no evidence of past releases. PRC noted grass grown over the former location of this SWMU (see Photograph No. 6).
SWMU 8	**Metal Chips Storage Area**
Unit Description:	This unit is located outdoors adjacent to the northern end of the manufacturing building. It consists of a 250-foot by 20-foot concrete-paved area in which several railroad cars are parked to store metal chips. The railroad cars are not covered. The concrete-paved area slopes toward an adjoining waste oil drain which receives waste oil that drains from the metal chips stored in the railroad cars and routes it to the WWTS (SWMU 5).
Date of Startup:	This unit began operation in 1980.
Date of Closure:	This unit is active.
Wastes Managed:	This unit manages nonhazardous metal chips and nonhazardous waste oil.
Release Controls:	This unit has no release controls for the metal chips. A waste oil drain is located adjacent to this unit to collect the waste oil that drains from the metal chips stored in the railroad cars.
History of Documented Releases:	No releases from this unit have been documented.
Observations:	During the VSI, three railroad cars contained metal chips. The railroad cars were not covered. PRC noted metal chips scattered on the pavement outside the unit (see Photograph No. 7).

SWMU 9	Swarf Mat
Unit Description:	This unit is located outdoors, about 250 feet north of the manufacturing building. The unit consists of a 180-foot by 100-foot concrete pad with about a 2-foot-high and 2-foot-wide concrete dike around it. The facility mixes waste lapping compound with fly ash on this concrete pad. Concrete dikes inside the unit divide it into compartments. The area around the unit is paved with concrete.
Date of Startup:	This unit began operation in 1983.
Date of Closure:	This unit is active.
Wastes Managed:	This unit manages nonhazardous waste lapping compound, waste oil, and fly ash. PRC was informed that beginning July 1993, these wastes will not be mixed and stored on site. The waste lapping compound will be picked up by a contractor in the manufacturing building where it is generated. The fly ash will no longer be generated because in July 1993, FMC will switch from using coal to gas to operate its boilers.
Release Controls:	This unit is located on a concrete pad which is surrounded by a concrete dike. The area around the unit is paved with concrete.
History of Documented Releases:	No releases from this unit have been documented.
Observations:	During the VSI, the unit contained a mixture of waste lapping compound and fly ash. PRC noted some fluid, apparently rainwater, had mixed with the oil component that had separated from the waste lapping compound and had floated to the top of the waste. The oil-bearing fluid had spilled over a containment dike onto the surrounding

pavement and had formed a pool. The pool prevented PRC from inspecting the pavement for cracks (see Photograph No. 8).

SWMU 10 **Storm Water Retention Pond**

Unit Description: This unit is located at the southeast corner of the facility. It is a 500-foot by 220-foot pond with a capacity of 12 million gallons (PRC 1993a). The unit is floored by a layer of clay (PRC 1993a). The unit receives storm waters from the entire facility. FMC employs booms and skimmers to collect floating oils from this unit and moves the mixture of water and skimmed oil in tanks by facility trucks to the WWTS (SWMU 5) for treatment and storage. The facility releases the wastewater to the Moore Drain, under an NPDES permit.

Are Sludges produced in the WWTS if so what happens to the sludge

Date of Startup: This unit began operation in 1956.

Date of Closure: This unit is active.

Wastes Managed: This unit manages nonhazardous waste oil.

Release Controls: The floor of this unit is made of a layer of clay of very low permeability. The ground surface around the unit is not paved and there are no dikes around the perimeter of the unit.

History of Documented Releases: No releases from this unit have been documented.

Observations: PRC noted no evidence of release. PRC noted oil stains along the banks of this unit.

4.0 AREAS OF CONCERN

PRC identified two AOCs during the PA/VSI. These AOCs are discussed below; their locations are shown in Figure 2.

AOC 1 Location of 1991 Gasoline Release

The FMC facility stored leaded and unleaded gasolines in a 15000-gallon steel UST during different time periods between 1978 and 1990. The UST, which was located outside the southern part of the manufacturing building, was removed to an off-site location in May 1991. During the removal of the UST, releases of gasoline to on-site soils and groundwater were documented. The facility removed the impacted soil to an off-site facility for landfilling, backfilled the UST cavity with visually clean soil, and paved the new ground surface with concrete (see Photograph No. 9). The facility collected subsurface soil and groundwater samples during the excavation of the UST and had them analyzed for BTEX, MTBE, and lead. The soil samples had BTEX, MTBE, and lead contents below the soil cleanup levels defined by Michigan Act 307, but the groundwater sample yielded elevated BTEX levels (HRC 1991b). The facility installed a monitoring well about 10 feet from the location of the removed UST and collected groundwater samples from the monitoring well. PRC has identified the Location of the 1991 Gasoline Release as an AOC because the contents of the tank were released to the groundwater and the surrounding soils, and the facility did not submit the analytical data on the groundwater samples from the monitoring well to a regulatory agency for review and consideration of the need for further remediation (PRC 1993c).

AOC 2 Location of 1992 Oil Release

From 1956 to 1990, the facility stored virgin hydraulic, cutting, and lubricating oils in five USTs in the old tank farm outside the northern part of the manufacturing building. A release of oil from one or more of these USTs to on-site soils was documented in February 1992. Information on the quantity and the type of oil released is not available. At the time of the VSI, the impacted soil and the empty

USTs had not been removed (see Photograph No. 10). The facility was following an MDNR-approved remediation action plan for their removal. PRC identified the Location of the 1992 Oil Release as an AOC because soils impacted by the oil release still remain at the site of the release.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The PA/VSI identified 10 SWMUs and 2 AOCs at the FMC facility. Background information on the facility's location; operations; waste generating processes and waste management practices; history of documented releases; regulatory history; environmental setting; and receptors is presented in Section 2.0. SWMU-specific information, such as the unit's description, dates of operation, wastes managed, release controls, history of documented releases, and observed condition, is presented in Section 3.0. AOCs are discussed in Section 4.0. Following are PRC's conclusions and recommendations for each SWMU and AOC. Table 3, located at the end of this section, summarizes the SWMUs and AOCs at the facility and the recommended further actions.

SWMU 1 **Enclosed SAAs**

Conclusions: No documented releases have occurred from this unit. The unit is located indoors on a concrete floor. It accumulates waste in containers that appeared to be in good condition. The potential for release to all environmental media is low.

Recommendations: PRC recommends no further action for this SWMU at this time.

SWMU 2 **Enclosed CAA and CSA**

Conclusions: This unit currently accumulates hazardous waste for less than 90 days, but it has stored hazardous wastes for more than 90 days in the past. The violation of more-than-90-day storage was resolved by MDNR in 1985 (MDNR 1985c). No documented releases have occurred from this unit. The unit is located indoors on a concrete floor. It accumulates hazardous waste in 55-gallon drums that appeared to be in good condition. The potential for release to all environmental media is low.

Recommendations: PRC recommends no further action for this SWMU at this time.

SWMU 3 **Chemical Laboratory**

Conclusions: No documented releases have occurred from this unit. It is located indoors on a concrete floor. It accumulates hazardous waste in a 30-gallon drum which appeared to be in good condition. This unit also managed obsolete laboratory chemicals (D002, D006, U044, U188, and U196) in the past as a one-time occurrence. The potential for release to all environmental media is low.

Recommendations: PRC recommends no further action for this SWMU at this time.

SWMU 4 **Enclosed Waste PCB Storage Area**

Conclusions: No documented releases have occurred from this unit. The unit is located indoors on a concrete floor. This unit is enclosed with a fence and it has a concrete-filled steel dike along its boundaries. It accumulates nonhazardous waste PCB-bearing oil in containers that appeared to be in good condition. The potential for release to all environmental media is low.

Recommendations: PRC recommends no further action for this SWMU at this time.

SWMU 5 **WWTS**

Conclusions: No documented releases have occurred from this unit. The unit manages nonhazardous wastewater and waste oil. The components of this unit include a building and four outdoor tanks. The building has brick walls and a concrete floor. The four outdoor tanks are located on concrete pads. The wastes this unit manages do not contain any known volatile constituents. The potential for release to all environmental media is low.

Recommendations: PRC recommends no further action for this SWMU at this time.

SWMU 6 **Inactive WWTS**

Conclusions: No documented releases have occurred from this unit. The unit operated from 1956 through December 1992. It managed nonhazardous wastewater and waste oil. The components of this unit consist of a building and five tanks that are located outdoors. The building has brick walls and a concrete floor. The tanks appeared to be in good condition. The wastes this unit managed did not contain any known volatile constituents. The potential for past release to all environmental media is low.

Recommendations: PRC recommends no further action for this SWMU at this time.

SWMU 7 **Former Waste Oil Storage Lagoons**

Conclusions: The two lagoons covered about 2.5 and 3.5 acres in area and were located on ground surface that was excavated to depths of 5 to 13.5 feet. This unit managed nonhazardous waste oil and wastewater. No waste was discharged in this unit after 1980. The facility removed all the waste to an off-site location in 1986. No waste has been stored in this unit since 1986. Release of waste oil and wastewater to on-site soils occurred between 1967 and 1986 when the facility stored wastes on the ground surface of this unit without using a liner. The potential for past release to groundwater was moderate to high because rain water passing through the waste could have infiltrated into the ground and impacted the groundwater. The potential for past release to air was low because the waste this unit managed did not have any known volatile constituents. The potential for past release to surface water was also low because of the absence of a direct migration pathway to the Moore Drain; the ground surface slopes toward the Storm Water Retention Pond (SWMU 10) which collects and treats all facility runoff before discharging it to the Moore Drain under an NPDES permit.

Recommendations: PRC recommends that the facility analyze on-site subsurface soil from the vicinity of the unit for total petroleum hydrocarbons (TPH). If the subsurface

See comment in executive summary

soil contains TPHs, then the groundwater should also be analyzed for TPH contamination.

SWMU 8 **Metal Chips Storage Area**

Conclusions: This unit manages nonhazardous wastes. Waste oil that drains from the metal chips collects in the waste oil drain. During the VSI, PRC noted metal chips scattered on the pavement outside the unit. The metal chips are considered relatively inert. Potential for release to all environmental media is low.

Recommendations: PRC recommends that FMC contain the metal chips within the limits of the SWMU.

SWMU 9 **Swarf Mat**

Conclusions: This unit consists of a 180-foot by 100-foot concrete pad with about a 2-foot-high and 2-foot wide concrete dike around it. The facility mixes waste lapping compound with fly ash on this concrete pad. The area around the unit is paved with concrete. An oil-bearing fluid had spilled over a containment dike and had formed a pool on the surrounding pavement. The pool prevented PRC from inspecting the underlying pavement for cracks. Although no documented releases have occurred from this unit, the potential for release to on-site soils and groundwater is low to moderate because the oil-bearing fluids could have migrated into the subsurface soils and groundwater through cracks in the pavement. The potential for release to surface water is low because of the absence of a direct migration pathway to the Moore Drain; the ground surface slopes toward the Storm Water Retention Pond (SWMU 10) which collects and treats all facility runoff before discharging to the Moore Drain under an NPDES permit. The potential for release to air is low because the waste managed in this SWMU does not have any known volatile constituents.

Recommendations: PRC recommends that the facility drain the pool of oil-bearing fluid and inspect the underlying pavement for cracks. If cracks are found, the facility should analyze the subsurface soil for TPHs. If the subsurface soil contains TPHs, then the groundwater should be analyzed for TPH contamination. PRC also recommends that the facility keep the waste contained within the limits of the SWMU.

SWMU 10 **Storm Water Retention Pond**

Conclusions: No documented releases have occurred from this unit. The unit is located outdoors and it manages a nonhazardous waste. The unit is floored by a layer of low-permeability clay. The waste this unit manages does not contain any known volatile constituents. The surface runoff from the entire facility collects in this unit and after treatment, it is discharged to the Moore Drain under an NPDES permit. No violations of the NPDES permit are known to have occurred. The potential for release to all environmental media is low.

Recommendations: PRC recommends no further action for this SWMU at this time.

AOC 1 **Location of 1991 Gasoline Release**

Conclusions: The facility documented a release of gasoline to on-site soils and groundwater from a 15000-gallon steel UST in May 1991. The release was documented during the removal of the UST. The UST had stored leaded and unleaded gasoline during different time periods between 1978 and 1990. The facility removed the impacted soil to an off-site facility for landfilling and backfilled the UST cavity with clean soil. The facility collected subsurface soil and groundwater samples during the excavation of the UST and analyzed them for BTEX, MTBE, and lead. The soil samples had BTEX, MTBE, and lead contents below the soil cleanup levels defined by Michigan Act 307, but the groundwater sample yielded elevated BTEX levels. The facility installed a monitoring well near the location of the removed UST and analyzed the groundwater from the monitoring well for BTEX, MTBE, and lead.

However, the facility did not send the analytical data on groundwater from the monitoring well to any regulatory agency for review and consideration of the need for further remediation. Potential for release to surface water is low because contaminants in the subsurface soil will have to move upward in order to mingle with surface water, which is unlikely. The potential for release to air is low because the impacted soil was removed in 1991 and the likelihood of any volatile compounds remaining in concentrations high enough to impact the air is low.

Recommendations: PRC recommends that the facility submit the results of the analytical data on the groundwater collected from the monitoring well to a regulatory agency for review and consideration of the need for further remediation.

AOC 2 **Location of 1992 Oil Release**

Conclusions: The facility documented a release of oil to on-site soils from one or more of the five USTs in the old tank farm in February 1992. At the time of the VSI, the impacted soil and the empty tank had not been excavated and the facility was following a cleanup schedule from an MDNR-approved remediation action plan. The potential for release to groundwater is moderate because the perched water at the FMC facility is within a few feet of the ground surface. The potential for release to surface water is low because the oil in the subsurface soil would have to migrate upward in order to mingle with surface water, which appears unlikely. The potential for release to air is low because the oil contamination is below the ground surface.

Recommendations: PRC recommends that the facility continue remediation in accordance with the plan approved by MDNR.

TABLE 3

SWMU AND AOC SUMMARY

SWMU	Dates of Operation	Evidence of Release	Recommended Further Action
1. Enclosed SAAs	SAA in Area A operated from 1988 to present and the SAA in Area C operated from 1956 to present	None	None
2. Enclosed CAA and CSA	1956 to present	None	None
3. Chemical Laboratory	1956 to present	None	None
4. Enclosed Waste PCB Storage Area	1982 to present	None	None
5. WWTS	December 1992 to present	None	None
6. Inactive WWTS	1956 to December 1992	None	None
7. Former Waste Oil Storage Lagoons	1967 to 1986	Release to on-site soils occurred between 1967 and 1986	Analyze subsurface soil for TPHs; if subsurface soil contains TPHs, analyze groundwater for TPH contamination.
8. Metal Chips Storage Area	1980 to present	None; however, during the VSI, PRC noted metal chips scattered on the pavement outside the SWMU.	Contain metal chips within the limits of the SWMU

TABLE 3
SWMU AND AOC SUMMARY (CONTINUED)

SWMU	Dates of Operation	Evidence of Release	Recommended Further Action
9. Swarf Mat	1983 to present	None; however, during the VSI, PRC noted some oil-bearing fluid that had spilled over a containment dike and had formed a pool on the adjacent concrete pavement. The pool prevented PRC from inspecting the underlying pavement for cracks.	Drain the pool of oil-bearing fluid and inspect the underlying pavement for cracks. If cracks are found, test the subsurface soil for TPHs. If the subsurface soil contains TPHs, analyze the groundwater for TPH contamination. Keep the waste from spilling over the containment dikes of the SWMU.
10. Storm Water Retention Pond	1956 to present	None	None

AOC	Dates of Operation	Evidence of Release	Recommended Further Action
1. Location of 1991 Gasoline Release	1978 to 1990	Release documented in May 1991	Submit the analytical data on the groundwater from the monitoring well to a regulatory agency for review and consideration of the need for further remediation.
2. Location of 1992 Oil Release	1956 to 1990	Release documented in February 1992	Follow the MDNR-approved remediation action plan

REFERENCES

Federal Emergency Management Agency. 1981. Flood Insurance Rate Map, City of Sterling Heights, Michigan. Community - Panel Number 2601280010E.

Ford Motor Company - Sterling Axle Plant (FMC). 1980. Notification of Hazardous Waste Activity. August 18.

FMC. 1981. Letter To U.S. Environmental Protection Agency. From A.W. Alexandrowicz. March 5.

FMC. 1983. Petition for Delisting. August 19.

FMC. 1985. Closure Plan, Surface Impoundments. April 15.

Hubbel, Roth, and Clark, Inc., Consulting Engineers (HRC). 1991a. Supplemental Investigative Report to Address the Ford Sterling Plant Underground Storage Tank Farm. May.

HRC. 1991b. Ford Motor Company, Sterling Plant, Remedial Investigation/Corrective Action Workplan. June 28.

Hutton and Williams, Law Firm (H and W). 1986. Letter To David A. Stringham. From William L. Rosbe. January 24.

Larson, Richard L. 1971. Soil Survey of Macomb County, Michigan. U.S. Department of Agriculture, Soil Conservation Service. September.

Michigan Department of Natural Resources (MDNR). 1985a. Letter to FMC. From Benedict N. Okwumabua. January 23.

MDNR. 1985b. Letter to E.C. Koops, Plant Manager, FMC. From Larry AuBuchon. September 3.

MDNR. 1985c. Letter to E.C. Koops, Plant Manager, FMC. From Larry AuBuchon. October 10.

MDNR. 1990. RCRA Inspection Report, FMC. October 26.

MDNR. 1993. Well Logs and Drilling Reports for a Part of Macomb County, Michigan.

National Oceanic and Atmospheric Administration (NOAA). 1990. Local Climatological Data Annual Summary for Detroit Metro Airport, Michigan, National Climatic Data Center. Asheville, North Carolina.

National Wetlands Inventory (NWI). 1978. Wetlands Map for Warren Quadrangle, Michigan.

Neyer, Tiseo, and Hindo, Limited, (NTH). 1986. Report on Preliminary Hydrogeologic Investigation, Sterling Axle Plant, Ford Motor Company, Sterling Heights, Michigan. March 7.

PRC Environmental Management, Inc. (PRC). 1993a. Record of Telephone Conversation Between Hans Upadhyay, Geologist, PRC, and David W. Brittain, Environmental Engineer, FMC. September 8.

PRC. 1993b. Record of Telephone Conversation Between Hans Upadhyay, Geologist, PRC, and Kenneth W. Jenkins, Section Supervisor, FMC. September 10.

PRC. 1993c. Record of Telephone Conversation Between Hans Upadhyay, Geologist, PRC, and Kathy A. Waskiewicz, Principal Staff Engineer. October 12.

PRC. 1993d. Record of Telephone Conversation Between Hans Upadhyay, Geologist, PRC, and June Hughes, Referral Specialist, City of Sterling Heights, Michigan. October 12.

U.S. Department of Commerce (U.S. DOC). 1983. Climatic Atlas of the United States, U.S. Government Printing Office, Washington, D.C.

U.S. Environmental Protection Agency (EPA). 1984. Letter to Sidney Kelly, Registered Agent for FMC. From Basil G. Constantelos. September 24.

EPA. 1985a. Letter to Jerome S. Amber, Principal Staff Engineer, FMC. From Basil G. Constantelos. September 30.

EPA. 1985b. Letter to D.L. Proffitt, Manager of Facilities Engineering, FMC. From David L. Stringham. December 12.

EPA. 1986. Final Order to FMC. From J.F. Greene, Administrative Law Judge. August 13.

U.S. Geological Survey. 1963. Topographic Map for the Warren Quadrangle, Michigan. 7.5 Minute Series. Photorevised 1980.

APPENDIX A

VISUAL SITE INSPECTION SUMMARY AND PHOTOGRAPHS

(Seven Pages)

VISUAL SITE INSPECTION SUMMARY

Ford Motor Company
Sterling Axle Plant
39000 Mound Road
Sterling Heights, MI 48310
MID 044 255 420

Date:	June 22, 1993
Primary Facility Representative:	David W. Brittain, Environmental Engineer, Ford Motor Company
Representative Telephone No.:	(313) 826-5718
Additional Facility Representatives:	M.P. Davis, Regional Environmental Engineer Kenneth W. Jenkins, Section Supervisor Rebecca L. Messick, Environmental Engineer
Inspection Team:	Hans Upadhyay, PRC Environmental Management, Inc. (PRC) David Berestka, PRC
Photographer:	David Berestka, PRC
Weather Conditions:	Sunny, humid, 75 °F
Summary of Activities:	The visual site inspection (VSI) began at 8:45 a.m. with an introductory meeting. The inspection team explained the purpose of the VSI and the agenda for the visit. Facility representatives then discussed the facility's past and current operations, solid wastes generated, and release history. Facility representatives provided the inspection team with copies of requested documents. The VSI tour began at 1:00 p.m. The inspection team inspected 10 SWMUs and two AOCs in the following order: Chemical Laboratory (SWMU 3), Location of 1992 Oil Release (AOC 2), Metal Chips Storage Area (SWMU 8), Enclosed Container Accumulation Area (CAA) and Container Storage Area (CSA) (SWMU 2), Enclosed Waste Polychlorinated Biphenyl (PCB) Storage Area (SWMU 4), Swarf Mat (SWMU 9), Former Waste Oil Storage Lagoons (SWMU 7), Enclosed Satellite Accumulation Areas (SWMU 1), Inactive Wastewater Treatment System (WWTS) (SWMU 6), WWTS (SWMU 5), Storm Water Retention Pond (SWMU 10), and the Location of 1991 Gasoline Release (AOC 1).

The tour concluded at 2:30 p.m., after which the inspection team held an exit meeting with facility representatives. The VSI was completed and the inspection team left the facility at 2:50 p.m.

Photograph No. 1 Location: SWMU 1
Orientation: East Date: 06/22/93
Description: Enclosed Satellite Accumulation Area (SAA) located in Area C of the manufacturing building where waste paint is accumulated in a 55-gallon drum (in cabinet, center of the photograph).

Photograph No. 2 Location: SWMUs 2 and 4
Orientation: Southeast Date: 06/22/93
Description: Enclosed Container Accumulation Area (CAA) and Container Storage Area (CSA) (SWMU 2) (left of photograph) and Enclosed Waste Polychlorinated Biphenyl (PCB) Storage Area (SWMU 4) (in cage, right of photograph).

Photograph No. 3
Location: SWMU 3
Orientation: West
Date: 06/22/93
Description: Chemical Laboratory where waste hexane (D001) is accumulated in a 30-gallon drum (top shelf of the cabinet).

Photograph No. 4
Location: SWMU 5
Orientation: East
Date: 06/22/93
Description: Wastewater Treatment System (WWTS) showing the WWTS building and some of the tanks.

Photograph No. 5 Location: SWMU 6
Orientation: Northeast Date: 06/22/93
Description: Inactive WWTS showing a process tank made of concrete.

Photograph No. 6 Location: SWMU 7
Orientation: North Date: 06/22/93
Description: Former Waste Oil Storage Lagoon

Photograph No. 7 Location: SWMU 8
Orientation: West Date: 06/22/93
Description: Metal Chips Storage Area (left of the photograph).

Photograph No. 8 Location: SWMU 9
Orientation: Southeast Date: 06/22/93
Description: Swarf Mat

Photograph No. 9 Location: AOC 1
Orientation: Southwest Date: 06/22/93
Description: Location of 1991 Gasoline Release (center of photograph; area of the release has been backfilled and paved over).

Photograph No. 10 Location: AOC 2
Orientation: East Date: 06/22/93
Description: Location of 1992 Oil Release (center, background).

APPENDIX B

VISUAL SITE INSPECTION FIELD NOTES

(Nine Sheets)

6/22/93 (51)

Ford Motor Company
Sterling Axle Plant
Sterling Heights, MI

Ford: Dave Brittain
Ken Jenkins
Mike Davis — Mid 70's
Rebecca Messick — Surrey

Meeting began at 8:45AM with PRC's Leans Headings and Dave Beresklaa.

Facility began in 1956, built in 1955; farmland before that. In 1966 SW "Annex" was added. 155.5 acres of property; 2.6 million square feet under roof.

Manufacture axle & drive shafts & I-Beam (a suspension unit) for the entire Ford company operations. Have

(52)

3000 employees; 3 shifts 7 days per week. Employed ≈ 9000 in 1982-83.

Receive castings for differential carrier, machined on site. Ring-and-pinion are machined ~~one~~ site. Machining, heat treating & lapping of ring-n-pinion in Area A.

In Area B carrier & differential are assembled. Area C has drive shaft, machining & assembly & machining of tubes. Detached from the main building area power house, oil tank farm, Salvage Bldg, & TWD WW ~~PS~~s (old & new).

(53)

Wastes generated:

- Paint-related material, HW 50-gal/month, maintenance in Paint shop, Accumm. Area; when full it goes to CSA in the Salvage Bldg. Have a fork-lift for moving. Have contract w/ S-K who use it as fuel blend. S-K comes every week (In Pontiac, MI)
- Toner flammable. Generated in all xerox machines may be F001 (will look up) About 2 gal/month. Ubiquitous in the facility, moved to Salvage Bldg. Contract w/ S-K, pick up every week. S-K fuel blends it.
- Waste Hexane D001 From Chem Lab for testing contamination (Q.C. checks). 5 gal/month; Admin Str. Bldg. Goes to Salvage Bldg

Picked up by SK every week.

- waste petroleum naphtha D001 Through the facility (marked with SK sign on map): ≈ 1000 gal/month. All recycled off-site by SK. All are 30 or 20 gallon drums, depending on the operation.

Non-Haz Wastes:

- Waste Oil
  Generated plant wide, machining & metal cutting 4 to 7% oil, rest is water. Drained (floor drains) to the new WWTP. ≈ 500,000 gal/year. Water is discharged to POTW & oil goes to reclaimer Edwards Oil in Detroit, & fuel blended & also

sell as reclaimed oil.

- Lapping Compound Flyash 50% oil 50% silica; mesh ring-n-pinion; once lapped, they are mated; silica turn to tiny particles, mix w flyash to stabilize it; After July 1993 it will be shipped off-site, it will be solidified by Michigan Disposal. Generated in NE of Area A. About 500 gallons /week. mixing is done East of Sewage Bldg.
- Metal chips.
  Throughout the plant generation, Accumulated in chip handling area, from machining process by cutting tubes; picked

by Zalev Bros in Windsor, Ontario to Cleveland Casting in Cleveland, OH. It is de-oiled in the motor chip area & the oil is drained to the ~~PO~~ WWTW.

- On PCBs

Had 50 transformers, changed to 42 in Dec. 1992 (remaining 8, are non-PCB). PCB oil were removed. handled by Unison (EPA truck# OHD 981093420) don't know the city. The ~~Co~~ residuals went to Rollins Env. of Deer Park, TX. The carcass went to Unison facility in Ashtabula;

TX. Liquid was total of 2400 gal (@ 300 gal each unit). Plant is phase out PCB to non-PCB transformers.

- Discarded several lab pack wastes ~ 2 yrs ago. One-time generation. All went to Rollins Env. Deer Pk, TX.
- No cadmium waste generated since Dave Brittain joined the company.
- Swarf sludge (non-haz, have TCLP data) Generated at NE corner of Area C; 500 gal per wk; in liquid form; water-borne paint sludge, & lapping compound & little swarf. Solidified on site by mixing w/ flyash.

Waste Mgmt Units

- Waste Acc. Areas in Operation for at least 5 yrs.
- Lab in use for hazwaste for 2 yr.
- WWTU (new)

Old was a continuous flow system; new one is a batch system. Oil/water mixture goes to one of 3 tanks (300,000 gal each). One tank completes the treatment. Each cycle takes 3 to 4 hrs to treat after filling. Check the pH (6 to 8.5), use $CaCl_2$ to stabilize, H_2SO_4 to lower it. After treatment allow 3–4 hrs

for separation. Oil stays in tank, skim it & send to oil treatment tank. Rags go w oil. Sludge also goes w oil. Water released to POTW (have a permit from Detroit), have a Consent agreement w DWSD; trying to achieve MDL limit on mercury & PCB) All tests (Hg & PCB) gave below-detection readings

500,000 – 700,000 gal/day used

Old WWTU used $FeCl_2$, continuous-flow, began when the building was first built, discontinued in Dec 1992. Water released same as in the ~~old~~ new one. They still use ~~magnesium~~ manganese phosphate.

It is a Lubsite (mn phosphate) parts are dipped in it (washer 8' x 30' x 1'), drained to the WWTU. Usage has gone down because they make only rear-wheel parts, most business now is front-wheel.

- Chrome treatment was tried ~~up~~ 8 yrs ago. Did not work. In the 1985 CEI D007 waste was reported on site for 790 days; don't know details of it; a failed experiment

- LAGOONS (NE & NW side) No use since 1985. Don't know the size or the wastes manged, don't know the beginning date.

- USTs
  Two, old & new. Old began operation (use) in 1956, addition made in 1966. ~~Eight~~ Fifteen tanks, 12 the old one; New farm will begin in July 1993. Old used to store oil. Eight (compartmentalized from five) were below ground. In-active since Dec. 1990. Steel construction (3 12000-gal & 3 20,000-gal in size). No USTs in the new.
- Removed gasoline tank
  Location was outdoors from

the SE side of the manufacturing building.

- Releases
  - Release from the tank farm was detected in 2/91 during investigation required by DNR. Don't know how much. They called DNR & local fire dept. The content released was oil. It is still there & a remediation action plan, approved by DNR, is being followed.
  - Unleaded gasoline from a 15000-gal UST. Release was noticed during its removal in 1991 (April).

Visually impacted soil was removed by Envirocon ENV. (Utica, MI) & was disposed in a landfill. Removal was closed & approved by DNR.

Broke for lunch 11:55AM.

Back from lunch at 12:45PM

Drinking water from the City of Detroit. Storm sewers around the facility, discharge point is at the SE corner. No complaints from employees that have to do with waste mgmt. Have an NPDES permit (both contact & noncontact waters) for one outfall. Have 38 air permits, mostly for boilers

& exhaust systems. No violations of NPDES or air permits. The facility has an 8-foot fence w/wire. Have 24-hour security. After hours only one gate is opened.

VSI began at 1:00 PM

Photo 1 Lab Waste Acc. Area (in steel cabinet)

Photo 2 Empty USTs; edge of these tanks go under the old oil storage facility next to them. All venting pipes have been removed from these USTs. Old bldg has oil tanks with oil in storage (to be moved to the new oil storage facility across from it.

Photo 3 New oil storage facility

Photo 4 Metal chips mgmt on railroad car

- Salvage Bldg.

Three drums of waste (each 55-g) dated 5/25/93 5/29/93 & 6/21/93. All on pallets. Photo #6 All have paint-related wastes

Photo #5 PCB storage crib. On a 10'x10' concrete floor w a steel grating on top. One yellow drum & one steel bucket resting on a pallet No cracks on the floor. 10 ft of concrete wall, then aluminum on top.

Paint waste area has a 10" steel (concrete filled dike)

- Swarf metal area
  Photo 7: mixed multiple waste, 2ft x 2ft dike. Whole area has compartments. Grey sludge oily surface metal, chips & swarfs.
- Lagoons
  Now covered w grass, Photo 8 and 9; some barren area in the middle
- Waste paint accumulation area
  One drum (55-g) inside a steel cabinet. No

cracks on floor. Has concrete wall one side, concrete/aluminum other two sides
Photo 10: Waste paint area

- Old WWTU
  Photo 11 main bldg
  Photo 12 Clarifier tanks
- New WWTU
  Photo 12, 13 Treatment tank in use
  Photo 13, 14 main bldg
- Retention Pd, some oily stains
- Location of removed gas tank.
  Photo 14, 15 →
  Now covered w concrete with a monitoring vent.

Exit meeting at 2:30PM
PRC off-site 2:50PM
Hans Mfadel

APPENDIX C

ANALYTICAL REPORT ON THE MIXTURE OF WASTE LAPPING COMPOUND AND FLY ASH

(Nine Sheets)

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Midwest, Inc.
Auburn Hills Division
1700 Harmon Road
Auburn Hills, MI 48326

Tel: (313) 391-2050
Fax: (313) 391-9698

ANALYTICAL REPORT

Dave Brittain
FORD STERLING PLANT
39000 Mound Rd & 17 Mile R
Sterling Heights, MI 48078

03/31/1992

Job No.: 92.1180
Sample No.: 103501

cc: Tom Geyer, EQO

Waste Characterization
Sample Description: Swarf Mat

Date Taken: 03/06/1992

Date Received: 03/10/1992

Parameter	Result	Regulatory Limit	Unit	Date Analyzed	Lab Tech.	Methodology
Cyanide, Total	<1.0		mg/Kg	03/16/1992	cms	9010 (1)
Corrosivity (pH)	8.0	<2.0 or >=12.5	units	03/12/1992	spr	9040 (1)
Ignitability (Flash Point)	>200.	<140	degree F	03/25/1992	akm	1010 (1)
Reactive Sulfide	<2.0	500	mg/Kg	03/12/1992	dds	Sec 7.3.4.1 (

Susan K. Scott
Project Manager

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03/31/1992

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cc: Tom Geyer, EQO

Waste Characterization
Sample Description: Swarf Mat

Date Taken: 03/06/1992

Date Received: 03/10/1992

Parameter	Result	Regulatory Limit	Unit	Date Analyzed	Lab Tech.	Methodology
PCB'S						
Aroclor-1016	<1.0		mg/Kg	03/25/1992	mmk	8080 (1)
Aroclor-1221	<1.0		mg/Kg	03/25/1992	mmk	8080 (1)
Aroclor-1232	<1.0		mg/Kg	03/25/1992	mmk	8080 (1)
Aroclor-1242	<1.0		mg/Kg	03/25/1992	mmk	8080 (1)
Aroclor-1248	<1.0		mg/Kg	03/25/1992	mmk	8080 (1)
Aroclor-1254	<1.0		mg/Kg	03/25/1992	mmk	8080 (1)
Aroclor-1260	<1.0		mg/Kg	03/25/1992	mmk	8080 (1)

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03/31/1992

Job No.: 92.1180
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cc: Tom Geyer, EQO

Waste Characterization
Sample Description: Swarf Mat

Date Taken: 03/06/1992

Date Received: 03/10/1992

Parameter	Result	Regulatory Limit	Unit	Date Analyzed	Lab Tech.	Methodology
METALS - TCLP						
Arsenic	<0.20	5.0	mg/L	03/30/1992	dlc	6010 (1)
Barium	0.37	100.0	mg/L	03/26/1992	jbb	6010 (1)
Cadmium	0.01	1.0	mg/L	03/26/1992	jbb	6010 (1)
Chromium	0.06	5.0	mg/L	03/26/1992	jbb	6010 (1)
Copper	0.04	100.0	mg/L	03/26/1992	jbb	6010 (1)
Lead	<0.05	5.0	mg/L	03/26/1992	jbb	6010 (1)
Mercury	<0.0005	0.2	mg/L	03/25/1992	rjk	7471 (1)
Nickel	<0.02	--	mg/L	03/26/1992	jbb	6010 (1)
Selenium	<0.50	1.0	mg/L	03/30/1992	dlc	6010 (1)
Silver	0.02	5.0	mg/L	03/26/1992	jbb	6010 (1)
Zinc	0.90	500.0	mg/L	03/26/1992	jbb	6010 (1)

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Job No.: 92.1180
Sample No.: 103501

cc: Tom Geyer, EQO

Waste Characterization
Sample Description: Swarf Mat

Date Taken: 03/06/1992

Date Received: 03/10/1992

Parameter	Result	Detection Limit	Regulatory Limit	Unit	Date Analyzed	Lab Tech.	Methodology
VOLATILE COMPOUNDS - TCLP							
Benzene	ND	<0.20	0.5	mg/L	03/25/1992	pmc	8240 (1)
Carbon tetrachloride	ND	<0.20	0.5	mg/L	03/25/1992	pmc	8240 (1)
Chlorobenzene	ND	<0.20	100.0	mg/L	03/25/1992	pmc	8240 (1)
Chloroform	ND	<0.20	6.0	mg/L	03/25/1992	pmc	8240 (1)
1,4-Dichlorobenzene	ND	<0.20	7.5	mg/L	03/25/1992	pmc	8240 (1)
1,2-Dichloroethane	ND	<0.20	0.5	mg/L	03/25/1992	pmc	8240 (1)
1,1-Dichloroethene	ND	<0.20	0.7	mg/L	03/25/1992	pmc	8240 (1)
Methyl ethyl ketone	ND	<0.20	200.0	mg/L	03/25/1992	pmc	8240 (1)
Tetrachloroethene	ND	<0.20	0.7	mg/L	03/25/1992	pmc	8240 (1)
Trichloroethene	ND	<0.20	0.5	mg/L	03/25/1992	pmc	8240 (1)
Vinyl chloride	ND	<0.20	0.2	mg/L	03/25/1992	pmc	8240 (1)

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ANALYTICAL REPORT

Dave Brittain
FORD STERLING PLANT
39000 Mound Rd & 17 Mile R
Sterling Heights, MI 48078

03/31/1992

Job No.: 92.1180
Sample No.: 103501

cc: Tom Geyer, EQO

Waste Characterization
Sample Description: Swarf Mat

Date Taken: 03/06/1992

Date Received: 03/10/1992

Parameter	Result	Detection Limit	Regulatory Limit	Unit	Date Analyzed	Lab Tech.	Methodology
BASE NEUTRAL COMPOUNDS - TCLP							
2,4-Dinitrotoluene	ND	<0.10	0.13	mg/L	03/19/1992	wad	8270 (1)
Hexachlorobenzene	ND	<0.10	0.13	mg/L	03/19/1992	wad	8270 (1)
Hexachlorobutadiene	ND	<0.10	0.5	mg/L	03/19/1992	wad	8270 (1)
Hexachloroethane	ND	<0.10	3.0	mg/L	03/19/1992	wad	8270 (1)
Nitrobenzene	ND	<0.10	2.0	mg/L	03/19/1992	wad	8270 (1)
Pyridine	ND	<0.10	5.0	mg/L	03/19/1992	wad	8270 (1)
ACID COMPOUNDS - TCLP							
3-Cresol	ND	<0.10	200.0	mg/L	03/19/1992	wad	8270 (1)
2-Cresol	ND	<0.10	200.0	mg/L	03/19/1992	wad	8270 (1)
4-Cresol	ND	<0.10	200.0	mg/L	03/19/1992	wad	8270 (1)
Cresol	ND	<0.10	200.0	mg/L	03/19/1992	wad	8270 (1)
Pentachlorophenol	ND	<0.10	100.0	mg/L	03/19/1992	wad	8270 (1)
2,4,5-Trichlorophenol	ND	<0.10	400.0	mg/L	03/19/1992	wad	8270 (1)
2,4,6-Trichlorophenol	ND	<0.10	2.0	mg/L	03/19/1992	wad	8270 (1)

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ANALYTICAL REPORT

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03/31/1992

Job No.: 92.1180
Sample No.: 103501

cc: Tom Geyer, EQO

Waste Characterization
Sample Description: Swarf Mat

Date Taken: 03/06/1992

Date Received: 03/10/1992

Parameter	Result	Detection Limit	Regulatory Limit	Unit	Date Analyzed	Lab Tech.	Methodology
PESTICIDES - TCLP							
Chlordane	ND	<0.010	0.03	mg/L	03/21/1992	mmk	8080 (1)
Endrin	ND	<0.010	0.02	mg/L	03/21/1992	mmk	8080 (1)
Heptachlor	ND	<0.0080	0.008	mg/L	03/21/1992	mmk	8080 (1)
Heptachlor epoxide	ND	<0.0080	0.008	mg/L	03/21/1992	mmk	8080 (1)
Toxaphene	ND	<0.10	0.5	mg/L	03/21/1992	mmk	8080 (1)
Lindane	ND	<0.010	0.4	mg/L	03/21/1992	mmk	8080 (1)
Methoxychlor	ND	<0.10	10.0	mg/L	03/21/1992	mmk	8080 (1)
HERBICIDES - TCLP							
2,4-D	ND	<0.025	10.0	mg/L	03/19/1992	mmk	8150 (1)
2,4,5-TP	ND	<0.025	1.0	mg/L	03/19/1992	mmk	8150 (1)

ND indicates the analyte was not detected at the detection limit (DL) specified for this sample.

NOTE: The TCLP results are Corrected Values based on Matrix Spike % Recovery data. The associated QC data is attached.

Susan K. Scott
Project Manager

OCEAN GROUP

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NET Midwest, Inc.
Auburn Hills Division
1700 Harmon Road
Auburn Hills, MI 48326

Tel: (313) 391-2050
Fax: (313) 391-9698

Client: FORD STERLING PLANT
Sample Number: 103501
Sample Description: Swarf Mat

03/31/1992

TCLP WASTE CHARACTERIZATION
QC SUMMARY REPORT ATTACHMENT

Parameter	Original Sample Concentration	Parameter Spike Concentration	Found Spike Sample Concentration	Expected Spike Sample Concentration	% Recovery
Arsenic, mg/L	<0.20	2.0	2.1	2.0	105
Barium, mg/L	0.33	10.	9.0	10.	90
Cadmium, mg/L	0.01	1.0	0.91	1.0	91
Chromium, mg/L	0.05	2.0	1.7	2.0	85
Copper, mg/L	0.03	10.	8.3	10.	83
Lead, mg/L	<0.05	2.0	1.8	2.0	90
Mercury, mg/L	<0.0005	0.10	0.011	0.10	110
Nickel, mg/L	<0.02	2.0	1.7	2.0	85
Selenium, mg/L	<0.50	1.0	1.0	1.0	100
Silver, mg/L	0.02	2.0	1.9	2.0	95
Zinc, mg/L	0.85	50.	47.	50.	94
Benzene, mg/L	<0.20	2.00	1.58	2.00	79
Carbon Tetrachloride, mg/L	<0.20	2.00	1.54	2.00	77
Chlorobenzene, mg/L	<0.20	2.00	1.62	2.00	81
Chloroform, mg/L	<0.20	2.00	1.64	2.00	82
1,4-Dichlorobenzene, mg/L	<0.20	2.00	1.80	2.00	90
1,2-Dichloroethane, mg/L	<0.20	2.00	1.62	2.00	81
1,1-Dichloroethene, mg/L	<0.20	2.00	1.88	2.00	94
Methyl Ethyl Ketone, mg/L	<0.20	2.00	1.88	2.00	94
Tetrachloroethene, mg/L	<0.20	2.00	1.48	2.00	74
Trichloroethene, mg/L	<0.20	2.00	1.52	2.00	76
Vinyl Chloride, mg/L	<0.20	2.00	1.36	2.00	68
2,4-Dinitrotoluene, mg/L	<0.10	0.13	0.11	0.13	85
Hexachlorobenzene, mg/L	<0.10	0.13	0.05	0.13	38
Hexachlorobutadiene, mg/L	<0.10	0.33	0.26	0.33	79
Hexachloroethane, mg/L	<0.10	0.33	0.43	0.33	130
Nitrobenzene, mg/l	<0.10	0.66	0.51	0.66	77
Pyridine, mg/L	<0.10	0.99	0.09	0.99	9
2-Cresol, mg/L	<0.10	1.05	0.75	1.05	71
4-Cresol, mg/L	<0.10	1.05	0.68	1.05	65
Pentachlorophenol, mg/L	<0.10	0.99	0.81	0.99	82
2,4,6-Trichlorophenol, mg/L	<0.10	0.66	0.61	0.66	92
2,4,5-Trichlorophenol, mg/L	<0.10	0.99	0.60	0.99	61

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Auburn Hills Division
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Auburn Hills, MI 48326

Tel: (313) 391-2050
Fax: (313) 391-9698

Client: FORD STERLING PLANT
Sample Number: 103501
Sample Description: Swarf Mat

03/31/1992

TCLP WASTE CHARACTERIZATION
QC SUMMARY REPORT ATTACHMENT

Parameter	Original Sample Concentration	Parameter Spike Concentration	Found Spike Sample Concentration	Expected Spike Sample Concentration	% Recovery
Lindane, mg/L	<0.010	0.10	0.081	0.10	81
Endrin, mg/L	<0.010	0.040	0.055	0.040	138
Chlordane, mg/L	<0.010	0.20	0.13	0.20	65
Heptachlor, mg/L	<0.0080	0.015	0.011	0.015	73
Heptachlor epoxide, mg/L	<0.0080	0.015	0.016	0.015	107
Toxaphene, mg/L	<0.10	0.20	0.21	0.20	105
Methyoxychlor, mg/L	<0.10	0.10	0.087	0.10	87
2,4-D, mg/L	<0.025	0.50	0.54	0.50	108
2,4,5-TP, mg/L	<0.025	0.50	0.95	0.50	190

TCLP Extraction Data:

Leaching Solution Used	1
Leaching Volume	3000 ml
Leaching Weight	150 g
Final pH	4.8

TCLP ZHE Data:

Leaching Solution Used	1
Leaching Volume	500 ml
Leaching Weight	25 g

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METHODOLOGY

(1) EPA SW846, "Test Methods for Evaluating Solid Wastes".

(2) ASTM, "American Society for Testing Materials".

(3) EPA 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes".

(4) "Standard Methods for the Examination of Water and Wastewater", 17th Edition, 1989.

(5) 40 CFR, Part 136; reprinted in EPA 600/4-82-057, "Methods for Organic Analyses of Municipal and Industrial Wastewaters."

(6) 40 CFR, Part 763;

(7) "Standard Methods for the Examination of Water and Wastewater", 16th Edition, 1985.

(8) Methods of Air Sampling and Analysis, 2nd. Edition.

(9) DNR, "Michigan Department of Natural Resources Laboratory Manual for Wastewater Treatment Plant Operators".

UNITS OF CONVERSION

ppm (part per million) = mg/Kg, mg/L, ug/g, ug/ml

ppb (part per billion) = ug/Kg, ug/L

% = ppm divided by 10,000

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

HRE-8J

May 5, 1994

Mr. David W. Brittain
Environmental Engineer
Ford Motor Company
Sterling Axle Plant
39000 Mound Road
Sterling Heights, MI 48310

Re: Visual Site Inspection
Ford Motor Company
Sterling Axle Plant
Sterling Heights, Michigan
MID 044 255 420

Dear Mr. Brittain:

The U.S. Environmental Protection Agency is enclosing a copy of the final Preliminary Assessment/ Visual Site Inspection (PA/VSI) report for the referenced facility. The executive summary and conclusions and recommendations sections have been withheld as Enforcement Confidential.

If you have any questions, please call Francene Harris at (312) 886-2884.

Sincerely yours,

Francene M. Harris for

Kevin M. Pierard, Chief
Minnesota/Ohio Technical Enforcement Section
RCRA Enforcement Branch

AB
file w/
Assessment

Ford Motor Company
Office of the General Counsel

Direct Dial: (313) 390-1874
Facsimile: (313) 390-3083

Suite 728 - Parklane Towers East
One Parklane Boulevard
Dearborn, Michigan 48126-2493

July 12, 1993

Kevin M. Pierard, Chief
OH/MN Technical Enforcement Section
United States Environmental Protection Agency
Region V
77 West Jackson St. (HRE-8J)
Chicago, Illinois 60604

Re: Visual Site Inspection
Ford Motor Company Sterling Axle Plant
Sterling Heights, Michigan
ID No. MID 044255420

Dear Mr. Pierard:

I am writing to express concern over the basis and the scope of a recent EPA investigation of a Ford Motor Company facility, and to request that greater attention be paid to these issues in the future.

In a letter dated June 11, 1993 to Mr. David Brittain of Ford Motor Company's Sterling Axle Plant, you indicated EPA's intention to conduct a Preliminary Assessment/Visual Site Inspection ("PA/VSI") at the Sterling Plant on June 22, 1993. Kathy Waskiewicz of Ford's Environmental Quality Office contacted you during the week of June 14 to inquire as to the basis for this inspection. On June 21, I discussed the matter with you and with Natalie Warkenthien of your office. Ms. Warkenthien sent me a telecopy of a September 3, 1985 letter from Larry AuBuchon of the Michigan Department of Natural Resources to Mr. E. C. Koops of the Sterling Plant and a document entitled "RCRA Inspection Report" dated 8/25/85. The letter and report allege that at that time the Sterling Plant accumulated hazardous waste longer than 90 days, which I understand is the basis relied on by EPA for the PA/VSI. I indicated to Ms. Warkenthien that I did not think this constituted a proper basis for the inspection but that Ford would nevertheless cooperate with the inspection. The inspection took place on June 22 as requested by U.S. EPA.

EPA's authority under Sections 104(e)(3) and (4) of CERCLA to enter and inspect facilities is limited to those situations where "there is a reasonable basis to believe there may be a release or threat of release of a hazardous substance of pollutant or contaminant." CERCLA Section 104(e)(1). In this instance, the 1985 documents provide no basis to believe there now may be a release of threat of release at the Sterling Plant. First, there is no statement or implication in the 1985 documents that there had been a release at the Sterling Plant, or that the alleged 90-day exceedence gave rise to a threat of release. Second, Mr. Koops' September 27, 1985 letter to Mr. AuBuchon, and Mr. AuBuchon's reply of October 10, 1985, document the fact that the alleged violations were corrected promptly and without incident. Third, the Sterling Plant has undergone a number of RCRA inspections subsequent to 1985, none of which have resulted in an alleged violation of the 90-day accumulation rule or any other finding suggesting there may be a release or threat of release. In light of the above, these eight-year-old documents cannot be considered to provide a "reasonable basis" to believe there may be a "release or threat of release" at the Sterling Plant.[1/]

Furthermore, even if the alleged 90-day violation had given rise to a threat of release, this would not justify the sort of fencepost-to-fencepost inspection requested in the PA/VSI. The nature and scope of the inspection should be tailored to the reasonably believed release or threat of release that gave rise to the inspection in the first place. In this case, the only area where the documents relied on could conceivably have suggested any "threat of release" would have been the drum storage pad, yet the inspection covered the entire facility. Because there is no relationship between the purported reason for the PA/VSI and the broad scope of the PA/VSI itself, we believe that EPA was acting outside its authority under Section 104(e) of CERCLA.

Ford is committed to cooperate with EPA in its administration of the RCRA program. We believe this is evident from our accedence to the PA/VSI despite our belief that the inspection was not properly authorized by statute. However, we request that in the future, EPA observe more carefully the limitations placed on EPA's inspection authority. Doing so will avoid unnecessary intrusions and expenditures of public funds as well as promoting mutual respect for legal standards.

[1/]Likewise, the PA/VSI is not authorized by Section 3007 of RCRA, which only permits EPA to conduct inspections relating to the generation, hauling, storage, etc. of hazardous waste.

Thank you for your attention to our concerns.

Sincerely yours,

Mark D. Edie
Staff Attorney

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cc: N. Warkenthien